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UNITED STATES ARMY

AVIATION DIGEST

JULY 1977

ARCSA

Aviation Requirements for the Combat Structure of the Army

UNITED STATES ARMY AVIATION DIGEST

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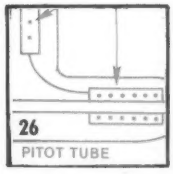

JULY 1977 VOLUME 23 NUMBER 7

Views From Readers 1
ARCSA III, MAJ George R. Hall; MAJ Russell H. Smith; MAJ Lewis D. Ray; CPT Lloyd D. McGammon 2
Valor Awards 4
Yano Hall 5
A Preplanned Accident To Test A Preaccident Plan 6
Fly, Plan International, CPT Roger E. McCauley; CW2 Frederick L. Cappo 8
EPMS Corner: Enlisted Flying Pay, SFC Douglas Allen 10
"Six Eight Four, Please Turn Right," Roland Weldon 12
—10 Corner: Weight A Moment 13
OPMS Corner: I Have An Answer For You!, CW4 Chuck Hawk; CW4 Lloyd Washer 14
Hall Of Fame, '77 16
Who Says I Can't Kill You, CPT William J. Ely Jr. 20
Aviation Center At A Glance, II 24
Pitot-Static Pitfalls, Barry Schiff 26
Just Another Incident? 32
I Knew That Was The Point Of No Return 35
Eject, Don Heyden 38
Pearl 46
ATC Action Line 48
Annual Writing Awards ..... Inside Back Cover
A Moment To Relax And Reflect ..... Back Cover

ABOUT THE COVER

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The mission of the *U.S. ARMY AVIATION DIGEST* is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

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Articles, photos, and items of interest on Army aviation are invited. Direct communication is authorized to: Editor, *U.S. ARMY AVIATION DIGEST*, Fort Rucker, AL 36362.

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VIEWS FROM READERS

Sir:

Hi. I was once a very skillful and highly trained mechanic and supervisor. Aviation mechanic no less, working on several different types of gas turbine engines. What's that you say? Oh, I could do to turbine engines what Betty Crocker could do to apples. I could inspect, adjust, repair and rebuild the turbine engines on a number of different Army aircraft. Yes, it was a job requiring a certain know-how, with all the delicate and precision parts that made it work. Heavens no, all that wasn't worth a hoot if the proper TMs weren't followed.It would only take a few thousandths of an inch to throw a turbine wheel out of balance causing damage to the bearings and set up a vibration out of this world. Well, let's see, nearly 10 years in that field. Well one day DA sent hundreds of letters to hundreds of NCOs that were needed somwhere else within the Army. Its been over a year now and I'm still a tank commander.

SSG Willard W. Hunter
Ft. Hood, TX

Sir:

We at the U.S. Army Reserve Flight Facility at St. Paul happen to be very proud of the high standards and quality of our aviators. They generally fly more hours, maintain more qualifications, and maintain a better safety and standardization record than most of their active counterparts. They do all this at probably one-fourth the cost to the American taxpayer and then hold down a full-time civilian job to boot.

We just wonder if the authors of the new ARs gave any thought to the Reserve Components when they wrote the changes placing even more requirements on our aviators. We don't feel they did and therefore submit the following cartoon – not for its humorous value, if any – but as a comment on what we feel may develop into a not so humorous situation, i.e., accidents, personnel retention problems, recruiting problems, domestic problems, etc.

Michael D. Rominger
Flight Instructor
USARFFAC
St. Paul, MN

Sir:

The March 1977 issue of the *AVIATION DIGEST* was full of good and

Continued on page 30

OH58 STAN RIDE, UH-1 STAN RIDE, U9 STAN RIDE, INSTRUMENT RENEWAL, NOE, FLIGHT PHYSICAL, NEW ANNUAL WRIT, THE BOSS WANTS ME TO WORK OVERTIME, BILLS, BILLS, BILLS...
WHAT'S WRONG WITH THAT GUY? NERVOUS BREAKDOWN?
NO - ITS JUST HIS BIRTH MONTH!

ARCSA

Major George R. Hall Major Russell H. Smith Major Lewis D. Ray Captain Lloyd D. McCammon

Directorate of Combat Developments
U. S. Army Aviation Center
Fort Rucker, AL

HAVE YOU RECENTLY encountered the acronym ARCSA III and wondered what it meant? ARCSA III sounds as if it names some faraway galaxy in a science fiction novel. But, it really has a more down-to-earth meaning – especially to Army aviators.

As spelled out in the title, ARCSA III is the acronym describing a TRADOC community study. It determines the aviation requirement to equip the active Army and its reserve components to fight in a high air defense threat environment from 1977 to 1986.

A special study group was formed at the U.S. Army Aviation Center, Ft. Rucker, AL, in January 1976 to perform the analysis for TRADOC headquarters. COL Robert L. Sauers, director of Combat Developments at the Aviation Center was the ARCSA III study director. LTG Frank A. Camm, deputy commanding general, TRADOC, was

ARCSA III study advisory group chairman. Representatives from all aviation TOE proponent centers and schools; Headquarters, TRADOC; DA; and other agencies provided input to contribute to the results of the study effort.

On 15 February 1977 the completed ARCSA III package was briefed to the U.S. Army Chief of Staff who approved it for implementation. Indeed, the study was not simply a study of aviation, done in isolation by a group of aviators.

ARCSA III was intended to determine how many aircraft, what types of aircraft, how many aviation personnel, and where all these assets should be located in the Army structure. You may wonder, "Well, what is wrong with our present aviation structure?"

There are a number of reasons why the Army aviation organization for combat must be overhauled. For starters, the current organization does not adequately consider the intense air defense environment looming as the threat. It was developed by ARCSA II in 1967 and modified by an aviation baseline study in 1972. Both oriented heavily on the low intensity combat environment of Southeast Asia.

Additionally, new progressive organizational ideas such as the FORSCOM Quick Fix – a noteworthy attempt to obtain the maximum antiarmor capability from existing aircraft – merited evaluation for Armywide application. Also, the current aviation organization does not adequately integrate new technology such as the introduction of the AH-1 Cobra TOW and the new family of aircraft beginning to enter the inventory.

These are just a few of the pressing developments that made reevaluation of the aviation organization necessary.

The basic Army force considered in ARCSA III (figure 1) essentially consists of 7 corps, 24 divisions, 27 separate brigades and 6 armored cavalry regiments (ACR). ARCSA III was to provide the blueprint for fitting Army aviation into these organizations. A primary goal was to reduce the number of "separate" units and locate all units in a division or corps structure. Units fight with divisions and corps; therefore, they should belong primarily to divisions and corps.

ARCSA III considered all the aircraft in the Army aviation inventory plus the new advanced attack helicopter (AAH), the utility tactical transport aircraft system (UTTAS), the advanced scout helicopter (ASH), and the modernized CH-47 Chinook (CH-47D). Additionally, specific issues were evaluated. At division level pooling of assets was examined and recommended.

- The reorganization of aviation assets in the division into a combat aviation battalion similar to that already tested in Europe also was recommended.
- At echelons above the division, pooling of numerous small separate TOE units was studied. Reorganization of the aviation units in the corps into either a combat aviation group or battalion was recommended.
- Organizations operating under a TDA were examined to reduce the number of aircraft used in other than combat roles.

Continued on page 17

GLOSSARY

TRADOC	Training and Doctrine Command
TOE	tables of organization and equipment
HQ	headquarters
DA	Department of the Army
FORSCOM	Forces Command
TOW	tube-launched, optically-tracked, wire-guided
ACR	Armored cavalry regiments
AAH	advanced attack helicopter
UTTAS	utility tactical transport aircraft system
ASH	advanced scout helicopter
TDA	table of distribution and allowances
AHC	attack helicopter company
ACT	air cavalry troops
mm	millimeter
CONUS	Continental United States
ITAADS	Initial Target Acquisition and Designation System
CSAC	combat support aviation company
MHC	medium helicopter company
IOSS	Intelligence Organization and Stationing Study
FY	fiscal year

Figure 1

Force Structure

Divisions		
Active	Reserve Component	Total
1 Airborne	5 Infantry	Light Div 10
1 Airmobile	1 Mechanized	Heavy Div 14
3 Infantry	2 Armored	
7 Mechanized	3 ACR	ACR 6
4 Armored		
3 ACR		
1 ACCB		ACCB 1

Separate Brigades		
Active	Reserve Component	Total
1 Berlin	1 Airborne	Light BDE 15
1 Armored	4 Armored	Heavy BDE 12
3 Infantry	10 Infantry	
	7 Mechanized	
Corps	Reserve 1	Total
Active 6 (5 structured)		

Valor Awards

Recipients of Annual American Legion Aviator Valor Awards are from left: LTC Clarence R. Reed, CPT Victor G. Grahn, CW3 Stephen L. Davidson and LCDR John M. Lewis. At far right is Mr. William A. Hill, Post No. 743 Commander

FOUR MILITARY fliers from the Army, Air Force and Coast Guard were honored with the 1977 American Legion Aviator's Valor Award in ceremonies last May at Ft. Hamilton, NY.

The award, established in 1953 by the American Legion Post No. 743 in Brooklyn, NY, is given for "a conspicuous act of valor or courage performed during an aerial flight, in or out of combat, by a rated member of the Armed Forces."

Chief Warrant Officer Stephen L. Davidson, an instructor pilot and commandant of the U. S. Army's 222nd Aviation Battalion High Altitude Rescue School, Fort Wainwright, AK, was honored for the rescue of two mountain climbers on Mt. McKinley. The helicopter rescue took place at the 15,000-foot level. The effort lasted for more than 20 hours.

Lieutenant Colonel Clarence R. Reed and Captain Victor G. Grahn, of the Air Force's 481st Tactical Fighter Training Squadron at Cannon AFB, NM, were cited for their actions during an F-111D inflight fire emergency, saving the aircraft from destruction.

Lieutenant Commander John M. Lewis, a Coast Guard rescue helicopter pilot assigned to Corpus Christi Air Station, TX, received the award for the rescue of the captain of a capsized oil drilling rig off the Texas Coast.

Yano Hall:

Homage To A Hero

Upper left: General Harrison assists Mr. and Mrs. Yano in unveiling plaque
Right: (L-R) COL Bahnsen, General Harrison and Mr. and Mrs. Yano during ceremony
Left: (L-R) SFC Yano's brother Glen, daughter Reni, and Mr. and Mrs. Yano following dedication
Below: Mr. and Mrs. Yano examine equipment inside hall named for their son
(photographs by Rick Wasser and Debbie Caskey)

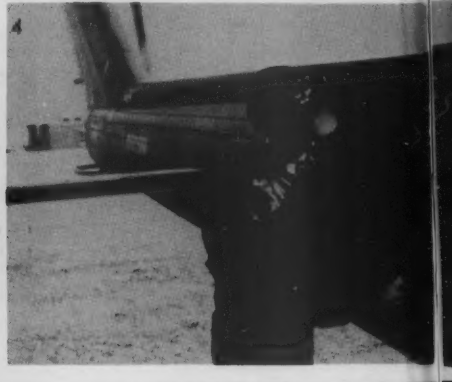
THE MAINTENANCE Training Division building, the largest structure at Fort Rucker, AL, was dedicated Memorial Day as Yano Hall. It was named in honor of Sergeant First Class Rodney J. T. Yano, a helicopter crewchief who was awarded the Medal of Honor posthumously for the action which led to his death on 1 January 1969, while serving with the Air Cavalry Troop, 11th Armored Cavalry Regiment, in Vietnam. (See "Among The Honored," page 2, June 1973 *DIGEST*.)

Attendees at the dedication included Sergeant Yano's parents and brother: Mr. and Mrs. Richard S. Yano and Glen, of Kealakekua, HI. Brigadier General Benjamin L. Harrison, Fort Rucker deputy commander, delivered the dedication address. Colonel John C. Bahnsen, Sergeant Yano's commander in Vietnam and flying with him in the helicopter the day he received his fatal injuries, also participated in the ceremony.

Yano Hall, which contains 123,247 square feet, is used for training OH-58 and UH-1 crewchiefs.

a preplanned accident to test a preaccident plan

USAAAVS



MAYDAY! MAYDAY! MAYDAY! Army Guard 31727. I can't move my pedals. We are in a spin going down 8 miles south of Midway." With that call began an exercise to test the reaction, preaccident planning, and aircraft accident investigation abilities of the Illinois ARNG. This exercise was part of a program entitled "The Field Aircraft Accident Investigation Training Course" being conducted by the U.S. Army Agency for Aviation Safety (USAAAVS). The Illinois ARNG has not had an aircraft accident in 6 years and the state aviation officer, Colonel Lawrence L. Hamacher, decided there was a need to test the unit's ability to react to a major mishap and provide the aircraft accident investigation board with refresher training.

Plans for the program had begun several weeks before. A program of instruction was developed and approved by USAAAVS. Before the exercise, COL Hamacher briefed the agencies outside the National Guard, including the FAA and the state police. He selected a location from which to conduct the training program and coordinated with the police and fire departments of the surrounding communities. The program was developed to test the unit's preaccident and investigation plans; provide 8 hours of classroom instruction at the conclusion of the practical exercise; and informally outline the shortcomings and areas requiring improvement.

The day before the program began, CPT Charles K. Griffin, chief of the investigation committee, and CW4 John C. Moodt, senior instructor of the investigation committee, both of the Education and Evaluation Division, USAAAVS, flew to Chicago, carrying with them portions of the wreckage of a previous major accident that was to be reenacted in Illinois. After landing and parking their aircraft without the unit knowing of their arrival, they met with COL Hamacher and proceeded to the area selected for the simulated crash to finalize details for the exercise.

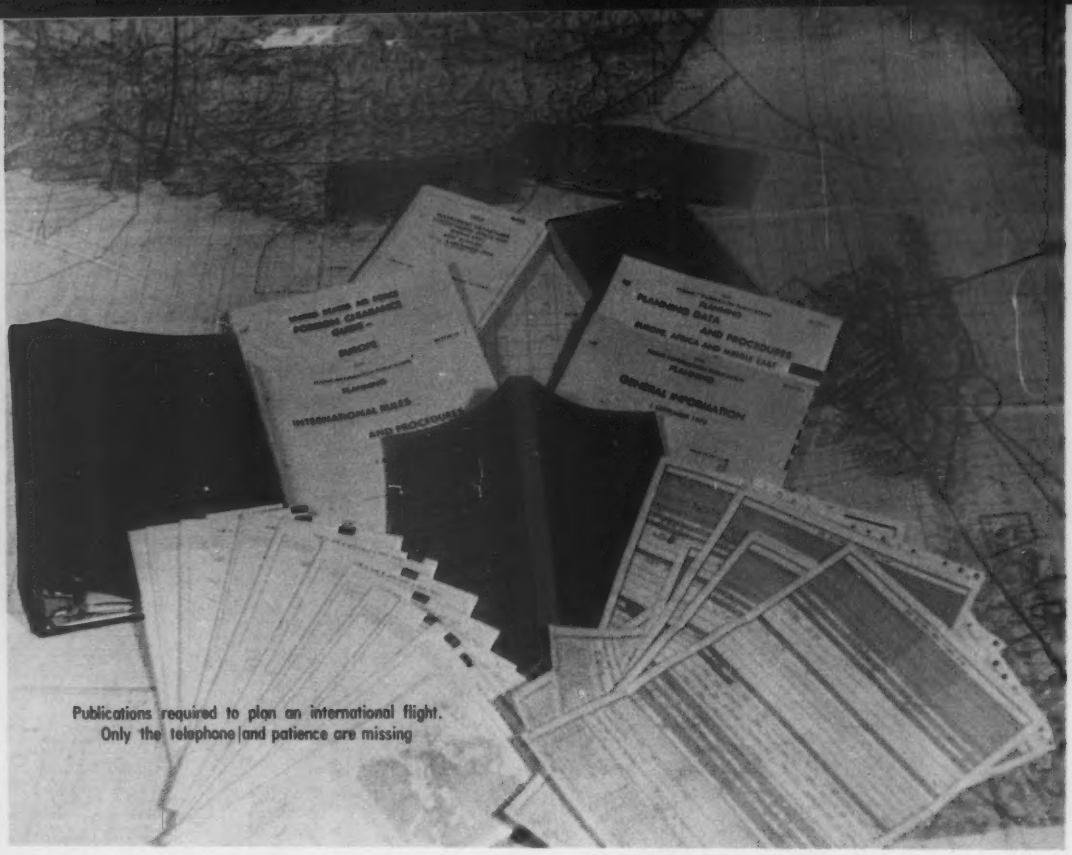
The following morning, COL Hamacher, under the guise of a valid mission, departed the Army aviation flight activity in a UH-1 and proceeded to the intended crash site. When he arrived over the site, a MAYDAY was declared using a code word to advise the FAA that a simulated accident and training exercise was being conducted. No one knew the time the exercise would be conducted other than it would be within a 2-month time frame. The FAA at Midway tower, Chicago, upon receiving the MAYDAY, activated the primary crash alarm system.

After landing at the preselected site, the crew of the aircraft was replaced by CPT Griffin and CW4 Moodt, who were to play the parts of the pilot and copilot. The crew chief, SP5 Foster, was told he had sustained certain injuries and to remain on the floor in the rear of the aircraft. His position made extraction difficult for an untrained crew of rescuers.

Within 3 minutes after the UH-1 landed, the local fire and police units arrived at the crash site. They were advised that it was a

Continued on page 44

Photo 1. Injured crew chief being evacuated by civilian crash crew.
Photo 2. Civilian fire department checking aircraft for fuel leaks and damage.
Photo 3. Boardmembers open accident investigation kit and begin their investigation.
Photo 4. CPT Griffin uses chalk to indicate structural damage to the aircraft.



Publications required to plan an international flight. Only the telephone and patience are missing

FLY, PLAN INTERNATIONAL USAREUR'S CROSS-COUNTRY

CPT Roger E. McCauley and CW2 Frederick L. Cappo
175th Aviation Company (AH), USAREUR

THAT CONVINCING, domineering, European winter has set in. The number of flying days has trailed off, even the SIP aviators are walking. In an IP room, somewhere in central Germany, a crowd huddles around a coffeepot.

By standing just outside the door, you can hear the sounds that often accompany the telling of war stories. Silently, without warning, the shadow of the operations officer fills the doorway. The coffee drinking stops and the voices subside one by one as they acknowledge his presence. A lone voice pierces the silence which has grown as thick as Stuttgart fog.

"What's happening, sir?"

The operations officer looks toward the interrogator. He takes his time in replying, choosing his words carefully. He looks perplexed.

"I've just come from a meeting with the CO. We've been given a mission that requires crossing some international boundaries. Has anyone ever planned an international flight?"

A dozen heads sway from left to right.

"Well then I'll need some volunteers to ..."

Before he can finish, the room explodes with the clamor of boots headed for the only other exit in the room, a window three stories up. In an instant all that is left are 12 paper cups. The operations officer looks distraught. What struck terror in the hearts of these seasoned USAREUR veterans? The thought of planning an international flight!

More and more Army aviators find themselves behind the pencil planning international flights for one reason or the other. Oddly enough, the attack helicopter brought the occurrence into perspective rather suddenly. When the AH-1G HueyCobras were brought to Germany in great

See Glossary
Page 23

quantity several years ago, range facilities were found rather limited in this country only slightly larger than the state of Oregon. The search continued until more suitable range facilities were located outside Deutschland.

When a decision was made to go outside this island of Army aviation surrounded by nine countries and the North Sea, quite a few aviators were involved in planning and flying international flights. The flights included heavy lift aircraft for ammunition carrying duties, fixed wing VIP flights and utility aircraft flying service support. These requirements and other varied and challenging tasks make the idea of international flying anything but farfetched.

Planning an international flight is not as impossible as it seems, but it does require some careful planning and technical know-how. All flight planning should be thorough but planning an international flight calls for special attention to detail. Army aircraft can plan and fly internationally filing either IFR or VFR, with VFR flights requiring slightly more planning. It's useless, though, to page through DOD publications looking for an index referencing planning procedures – international flight routes never flown before – it just isn't there. What you will run across in your search are bits and pieces of information that need to be collected and implemented in an orderly, logical format.

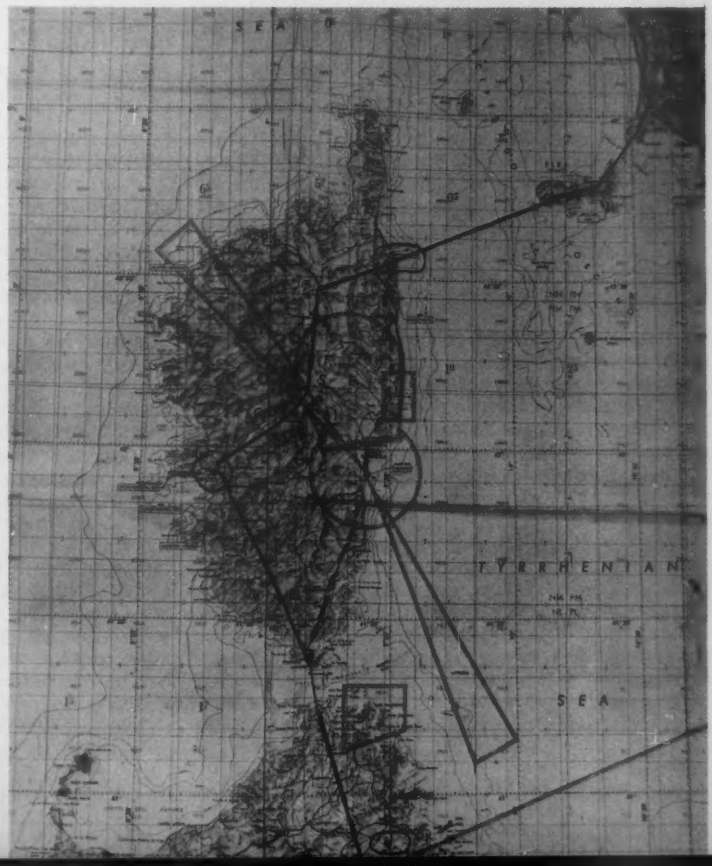
The following steps for planning an international flight were summarized after actually planning and flying several international trips. The flights were unique in that no previous Army flights or any flight of similar nature were flown along the courses taken. As in all things new, the bugs had to be worked out. When they were, only a definite sequence of planning was left; one that got the job done with a minimum amount of wasted effort. Here they are – general enough to apply for both IFR and VFR flights, yet specific enough to include all necessary actions.

No matter what flight rules you observe, your first move should be to scan the FLIP Planning Chart (you probably will want the low altitude version). It will give a good perspective of the overall operation and some good references for more detailed attention. It also gives an idea or two for possible alternate routes. But since the FLIP gets printed only twice a year, you may have to look around for it. If you are lucky, some joker just may have put it up in the briefing room, where it should be anyway. Your next move should be to gather all the low altitude enroute charts for the flight route. By using the airways as a guide, the most direct route between landing points can be plotted. The most important restricted areas will be depicted and so will all those helpful, usable navigational aids. While the charts are unfolded, choose an alternate route.

Next, the route of flight should be plotted on VFR maps, if you have the maps. If you don't, and have never ordered maps before, several questions will arise. Where do I get them? You'll probably spend a lot of time questioning your fellow aeronauts about this. Chances are they'll reply with a shrug or an "ask the operations specialist who maintains your unit FLIP account." You'll be surprised at what goodies are available and being provided on a subscription basis. After some discussion about charts, you'll be introduced to the DMA Catalog of Maps, Charts and Related Products, Part I: Aerospace Products. The specialist advises, "It is all right there, but if you really want help, call those troops in Heidelberg, USAASDE. Phone number is right here in the front of the supplement." After perusing

Continued on page 21

Photo depicts flight over water and over mountains on a 1 to 500,000 scale map



EPMS CORNER

Enlisted Flying Pay

SFC Douglas Allen
Aviation Career Advisor
U.S. Army Military Personnel Center

WHAT IS flying pay? Am I authorized to draw flying pay? How much flying pay can I draw? If I've got flight orders, can my flying pay be stopped? These are typical questions frequently asked by young Soldiers in the Aviation Maintenance Career Management Field.

There are two categories of flying pay authorized for enlisted personnel:

(1) *Crewmember* – Duty positions that involve the performance of duties in flight which are essential to the operation of the aircraft; the operation of a primary airborne electronic sensory system; the operation of a primary airborne electronic intelligence collection system; the operation of a primary airborne electronic target acquisition system; the operation of a primary aerial weapons system; and medical evacuation of personnel (crew complement).

(2) *Noncrewmember* – Duty positions other than crew complement that require performance of military duties in flight directly related to the in-flight mission of the aircraft, provided personnel are required to perform frequent and regular flights in the discharge of their assigned duties.

Crewmember Positions. Enlisted personnel assigned to table of equipment (TOE) or table of distribution and allowances (TDA) units occupying authorized crewchief, crew engineer, assistant crewchief, assistant crew engineer or aircraft mechanic assigned to a crewchief position may be placed on crewmember flying status. The number of flying status positions is based on assigned aircraft.

Heavy cargo helicopters, medium cargo helicopters and medium fixed wing transport airplanes may be authorized two positions per aircraft. Utility helicopters, observation helicopters (when assigned to a tactical unit engaged in combat or to an aero scout platoon and the crewchief habitually flies as a gunner or observer), light fixed wing utility airplanes (U-1) and utility airplanes (U-21) used in the cargo/troop transport configuration may be authorized one enlisted crewmember per aircraft.

In air ambulance units, TOE and TDA medical aidmen actively and continuously engaged in the administration of medical care and treatment of patients while being transported in flight may be authorized crewmember flying status at a rate of one aidman per aircraft regularly used for medical evacuation.

Crash rescue specialists assigned to helicopter ambulance air rescue units may be authorized flying status at a rate of one per aircraft employed in the aircraft crash rescue mission.

Enlisted personnel assigned to units engaged in combat may be authorized flying status for approved door gunner positions.

Noncrewmember Positions. Noncrewmember flying status may be authorized for aviation platoon, section and detachment sergeant, aircraft maintenance supervisors, and technical inspectors in units equipped with a total of six or more observation, reconnaissance, surveillance, utility, attack, or light fixed wing or rotary wing aircraft. Additionally, in units equipped with such aircraft, one aircraft crewchief/mechanic or one aircraft system repairer per *each multiple of six* or major fraction thereof is authorized noncrewmember flying status.

Also, noncrewmember flying status may be authorized for aviation platoon, section and detachment sergeants; aircraft maintenance supervisors; and aircraft technical inspectors in units and detachments which are equipped with a total of two or more medium or large cargo type aircraft. These units also may be authorized one noncrewmember flying status position for crewchief/mechanic or aircraft system equipment mechanic or aircraft system equipment mechanic/repairer per each *multiple of three aircraft* or major fraction thereof.

Aircraft maintenance platoon, section and detachment sergeants; aircraft maintenance supervisors; and aircraft technical inspectors in headquarters companies, batteries, troops or detachments of TOE aviation groups, aviation battalions, or aviation squadrons exercising direct and continuing command over two or more operational aviation companies, batteries or troops may be authorized noncrewmember flying status.

Aircraft maintenance or repair platoon

Enlisted Personnel Management System

Enlisted Crewmember Flight Payscale

PAYGRADE	YEARS OF SERVICE									
	under 2	over 2	over 3	over 4	over 6	over 8	over 10	over 12	over 16	over 18
E9	105.00	-	-	-	-	-	-	-	-	-
E8	105.00	-	-	-	-	-	-	-	-	-
E7	80.00	85.00	85.00	85.00	90.00	95.00	100.00	105.00	-	-
E6	70.00	75.00	75.00	80.00	85.00	90.00	95.00	95.00	100.00	-
E5	60.00	70.00	70.00	80.00	80.00	85.00	90.00	95.00	-	-
E4	55.00	65.00	65.00	70.00	75.00	80.00	-	-	-	-
E3	55.00	60.00	-	-	-	-	-	-	-	-
E2	50.00	60.00	-	-	-	-	-	-	-	-
E1	50.00	55.00	-	-	-	-	-	-	-	-
E1 (under 4 mos)	50.00	-	-	-	-	-	-	-	-	-
Aviation Cadets	50.00	-	-	-	-	-	-	-	-	-

(If no amount is shown for a pay grade under cumulative years of service, the amount immediately to the left applies.)

sergeants; shop foremen; aircraft maintenance section or branch sergeants; aircraft maintenance or repair supervisors; and aircraft technical inspectors in TOE/TDA direct support and general support aircraft maintenance units and activities may be authorized noncrewmember flying status.

Enlisted personnel may be authorized noncrewmember flying status while performing as air observers in units whose normal ground mission requires the use of aircraft for air photography, mapping and similar purposes other than combat surveillance.

Armorers of primary aerial weapons systems may be authorized noncrewmember flying status in TOE units provided they are required to perform frequent and regular aerial flights in performance of their duties on the aerial weapons systems. These positions are limited to two per unit.

Physical Standards. Enlisted personnel who are assigned to positions authorized crewmember or noncrewmember flying status must meet Class 3 medical standards in order to qualify.

120-Day Advance Notice. Enlisted crewmembers will be accorded at least 120 days' advance notification prior to being involuntarily removed from flying duty through no fault or action of their own. The servicemember may waive the advance notice by so stipulating in writing to competent authority.

Flying pay may be continued for 120 days although advance notice of termination is less than 120 days and minimum performance requirements are not met. This will be permitted only under unusual and compelling circumstances such as national emergencies, short notice of unit deactivation and manpower authorization reductions, when it is not possible to give 120 days' advance notice of removal from flying duty.

Advance individual notice of removal from enlisted crewmember flying duty shall be written – by competent authority – or verbal, provided a suitable memorandum for record is made and it is later followed in writing.

Removal from enlisted crewmember flying duty for cause includes but is not limited to removal for failure to satisfactorily perform assigned duties; reclassification or school attendance based on servicemember's request; confinement; AWOL; reduction in grade; medical unfitness; or separation.

Enlisted noncrewmembers are not required to be provided advance notice prior to removal from flying duties and attendant loss of flight pay.

Flying Pay Rates. Enlisted crewmember flying pay varies with grade and years of service as indicated in the payscale extracted from the "DOD Military Pay And Allowances Entitlement Manual" (see figure). Noncrewmember flying pay is $55 per month regardless of grade or years of service.

For further details on enlisted flying status, refer to AR 600-106 and the "DOD Military Pay And Allowances Entitlements Manual."

"Six Eight Four, Please Turn Right"

Roland Weldon
Directorate of Training Developments
U.S. Army Aviation Center

IT WAS LATE evening and there was only the one aircraft. The pilot had reported 50 miles west and wanted to make a ground controlled approach (GCA) radar approach. I'd switched to the maximum 53-mile range of the CPN 18A radar scope. Sure enough, there I'd seen a target, just inside the scope's outer western edge, moving east. Everything had checked. The aircraft's position, as reported by the pilot, plus the size and speed of the target being observed, had led me to believe that I was looking at a C-47 type aircraft. Still, I had to be sure.

"Six eight four, what is your heading? Over."

"Six eight four, my heading is zero nine zero," came the reply.

"Roger, six eight four, for radar indentification, turn left heading zero four five for one minute, then resume normal inbound heading, over."

"Six eight four, roger turning left."

After having observed the target's left turn, followed by the right turn inbound, I'd transmitted, "Six eight four, radar contact five zero miles west of airport, continue heading zero niner zero, if no transmissions are received for one minute...."

After that, there had been little to do other than watch 684's target as the pilot flew the 40 odd miles toward the GCA traffic pattern. Flying at 130 knots this was expected to take some 20 minutes. Until the aircraft arrival in the pattern, control was to be confined mostly to observing the target and reporting its progress through frequent position reports to the pilot (at least once each minute).

"Six eight four, four seven miles west of airport, over."

"Six eight four, roger."

"Six eight four, this will be a precision radar approach to runway three two right. Runway three two right is seven thousand two hundred feet in length...."

"Six eight four, roger."

"Six eight four, four five miles west of the airport, over."

"Six eight four, roger."

The target's speed had appeared faster than normal, so I'd transmitted, "Six eight four, you appear to be making good time, what is your airspeed? Over."

"Six eight four, I'm indicating one thirty seven. I've got a good tailwind up here, though."

Some 40 uneventful miles and a number of position reports later found 684's target 5 miles west of the airport, a position from which a turn to the downwind leg normally was made.

"Six eight four, turn right heading one four zero for downwind, descend and maintain two thousand."

"Six eight four, roger, turning right to one four zero, leaving five thousand."

The only problem was that 684's target had not turned, but had continued east. The first pangs of doubt had crept in. What in the world's going on? "Six eight four, what's your heading? Over."

"Six eight four, I'm heading one four zero, over."

Well, the target that I'd been controlling sure wasn't heading one four zero. Still, it wasn't too uncommon for pilots to simulate a gyro compass out to see if we in GCA would recognize it. And, it just might be that the pilot's gyro was out. With this sort of thinking, I'd gone ahead and initiated a no-gyro.

"Six eight four, do you understand the no-gyro procedure? Over."

"Six eight four, affirmative."

"Six eight four, turn right now." And hopefully, I'd added, "You should be in a right turn, over."

"Six eight four, roger, I'm in a right turn."

The target had not turned. Instead, it had continued on its monotonous eastbound journey, and was even then passing over the antenna, still

eastbound. The pangs of doubt had then turned to a sick feeling, because I'd known that I had been controlling the wrong aircraft.

"Six eight four, radar contact lost, do you know your position? Over."

Shortly after that, I'd found the *real* 684 14 miles to the west, still in a right turn. I'd then vectored the pilot to the airport where the GCA had been made, without further mishap.

Who was the mystery target? Well, it seems that a Convair 440 commercial airliner had passed above 684 at the time radar contact first was being established. The targets of the two had apparently merged on the radar scope and I had begun controlling the faster Convair, which also happened to be following the same route as 684. The initial position of the two aircraft being near the scope's edge probably had contributed to the misidentification. It was never to be explained why I failed to observe the real 684 behind the faster target.

While this 1957 incident was to cause little more than inconvenience for 684's distraught pilot, the problems of misidentification have continued to plague radar controllers, often with serious and even tragic consequences. Final controllers have been known to talk targets right down to the runway, only to have pilots of the real targets report their position 8 and 10 miles on final approach. Tragically, aircraft have flown into mountains while radar controllers were unknowingly controlling the wrong targets.

If there is one common thread tying all the incidents of misidentification together, it would have to be the presence of a nagging tinge of doubt, or some sort of incompatability, which in retrospect should have alerted the controller to action. In 684's case, it was the fast airspeed. In other cases, a faulty position report, and even in one case the misreading of an altimeter by the pilot, which had controllers vainly searching an elevation scope for a descending jet aircraft at 2,000 feet, who had leveled prematurely at 12,000.

Impossible, no! Impractical, yes. But, this is the controller's world. Here, nothing can be taken for granted. *Doubts must be the rule, not the exception.* In answer to every doubt, the monotony of procedure, exact and absolute, must be repeated with alertness and precision. For the controller to do otherwise is to err—and to err may well be tragic!

[redacted]

[redacted]

[redacted]

-10 CORNER

Weight A Moment

Recently the instructions for computing the moment in block 17 of the DD Form 365F (Transport) were changed in the UH-1D/H Huey Operators Manual to clear up a gray area that has been with us many years. The problem existed because the instructions for computing weight and balance did not state that the moment/100 for fuel burnoff is *not* the same as the moment/100 for fuel weights in the fuel loading table, chart 12-2, sheet 3 of 16, page 12-6, TM 55-1520-210-10.

Prior to the change, paragraph 12-6t of the dash 10 instructed the crew to "estimate the weight of the fuel which may be expended before landing" and "enter this figure together with moment/100 in the spaces provided" in block 17 of DD Form 365F.

These instructions have led persons computing weight and balance to read the moment for the expended fuel directly from the Fuel Loading Table. For example, according to the Fuel Loading Table for the crashworthy system the moment/100 for 975 pounds is 1,428. If this moment had been entered in block 17 and subtracted from the takeoff conditions to find the estimated landing condition, the calculated landing center of gravity (CG) would be incorrect.

The correct method requires the following calculations: First, estimate the amount of fuel onboard at landing. In the example above, 325 pounds would be onboard at landing if 1,300 pounds were onboard at takeoff (1,300-975=325). Second, from the Fuel Loading Table we find that the moment/100 for 325 pounds is 431. Finally, subtract 431 from 1,979, the moment for 1,300 pounds, and enter the result (1,548) in block 17 with the 975 pounds of fuel consumed. When we compare the CG derived by using this moment with the CG from the previous method, we find there is an approximate 2-inch difference in CG. That 2-inch error could be critical when the CG is near the fore or aft limit.

OPMS CORNER

I Have An Answer For You! ...

CW4 Chuck Hawk and CW4 Lloyd Washer
Warrant Officer Division
Officer Personnel Management Directorate

IN THE PAST FEW years the aviation warrant officer (AWO) population has declined from more than 14,000 to less than 5,500. In the same period the budget for managing AWOs similarly has undergone a major reduction. These factors, along with the changing times since the "boom" days of the Vietnam era, have led to many changes in the management of aviation warrant officers. In this article we hope to highlight some of these changes and clear the air in areas which apparently are confusing some Soldiers in the field.

The majority of the telephone calls received by assignment officers in the Warrant Officer Division, Military Personnel Center (MILPERCEN) normally begin with the callers identifying themselves, followed by the statement, "I have a question for you!" So in reply to your questions, we have some answers for you:

Q: Is the individual who makes my assignment an aviator?

A: Yes, all the assignment officers in the Warrant Officer Division at MILPERCEN who manage AWOs are aviators (see figure). Additionally, we have three more aviators assigned: LTC Bob Lenderman, deputy division chief; Major Howard Born, chief, Professional Development Branch; and CW4 John Valaer, Personnel Actions Branch. We also should mention that we have a new division chief, Colonel Bob Travis, who came aboard early last January.

Q: What factors do assignment officers consider when selecting an AWO for an overseas assignment?

A: The individual's date of return from his or her last overseas assignment; the date of last permanent change of station; the mandatory retirement date; number of completed short tours; number of completed long tours; amount of active federal service (AFS); the personnel strength within the command to which that person is assigned; and the individual's desires.

Q: What are the prerequisites for obtaining an advanced aircraft checkout and for obtaining a career track course such as the Aviation Safety Officer Course?

A: To ensure an equitable professional development opportunity among all career status warrant officer aviators, functional training has been limited to one advanced aircraft qualification and one career track per individual. If, for example, you are AH-1G HueyCobra qualified, you have received your advanced aircraft and will not be considered for another. If you have previously received training in the aviation safety field then you will not be sent to Aviation Maintenance Officer Course (AMOC). After completion of a minimum of 3 years service as a rated warrant officer that person can be considered for advanced aircraft qualification training. After completion of a minimum of 6 years service as a rated warrant officer a member can be considered for career track training, i.e., Aviation Safety Officer Course, Aviation Maintenance Officer Course, Instructor Pilot Course or Rotary Wing Instrument Flight Examiners Course (RWIFEC).

To attend RWIFEC, a member must have previously attended an instructor pilot course and have served a utilization tour as an instructor pilot. Your manner of performance of duty must be above average when compared with your contemporaries. Maximum AFS cannot exceed 13 years if your component is U.S. Army Reserve (USAR) or 16 years if your component is Regular Army (RA).

Q: What are the prerequisites for attendance at the Aviation Warrant Officer Advanced Course?

A: You must be in grade CW2 and have 4 to 9 years of warrant officer service. Active federal service cannot exceed 17 years if your component is USAR, or 24 years if Regular Army or if you have accepted participation in the Managed Tenure Program (MTP) or Long Range Active Duty Program (LRADP).

Q: What are the prerequisites for attendance at the Warrant Officer Senior Course?

A: You must be in grade CW2 (P) or CW3 and have at least 9 years of warrant officer service. AFS cannot exceed 17 years if your component is USAR or 24 years if RA or if you have accepted participation in the MTP or LRADP.

Q: Can I go to one of the career courses in conjunction with my next move?

A: Not unless you are selected by a Department of the Army Board. If chosen, you will be assigned to the designated class at the U.S. Army Aviation Center at Ft. Rucker, AL. Assignment officers have *no* control over who goes or when they will go.

Q: What civilian education programs are available and what are the prerequisites for attendance?

A: Programs – Fully-funded associate degree in military occupational specialty (MOS)-related specialty (see AR 621-2, chapter 4); degree completion – associate degree in MOS-related specialty (See AR 621-2, chapter 8); permissive TDY – associate degree in MOS-related specialty (see AR 621-2, chapter 8); and tuition assistance (see local education center).

Criteria – Fully-funded, degree completion and permissive TDY programs are administered by MILPERCEN. Applicants must have 5 years of warrant service (4 years for advance course graduates).

Managing CONUS Assignments Are:

TRADOC	CW4 Will Stuckey	AV	221-7835
FORSCOM	CW4 Tom Keene		221-7836
Bragg			
Hood	CW4 Charlie Sturtevant		221-7835
Campbell			

Overseas Assignment Managers Are:

Europe	CW4 Chuck Hawk
Other Overseas	CW4 Lloyd Washer

RA officers must be able to complete the school and service obligation before reaching 23 years of active federal service. Other than Regular Army (OTRA) must be able to complete schooling and service obligation before reaching 20 years of AFS. Applicants' performance potential must justify schooling. Information on tuition assistance programs may be obtained from the local education center.

Q: I recently received orders assigning me to the 21st Replacement Battalion in Frankfurt, Germany. I thought that warrant officer assignments were to specific units in U.S. Army, Europe (USAREUR). Is that not the case?

A: The initial order moving a warrant officer to USAREUR will assign that person to the 21st Replacement Battalion in Frankfurt. About 90 to 120 days prior to the overseas report date USAREUR will make the ultimate "pinpoint" unit assignment. USAREUR will then forward this assignment to the individuals servicing Military Personnel Office (MILPO). A "pinpoint" assignment then will be issued in the form of an amendment to the person's original orders which made the assignment to the 21st Replacement Battalion.

Q: Must I wait until I receive my "pinpoint" assignment instructions from USAREUR before applying for dependent travel?

A: No. You should make application for dependent travel immediately upon receipt of orders assigning you to the 21st Replacement Battalion. Approval for concurrent travel of dependents hinges on availability of housing at ultimate assignment.

Q: How long can I expect to stay stateside (at any post) in Continental United States (CONUS)?

A: Minimum, mandatory time onstation within CONUS is 36 months and normally you will not move prior to that. Normal turnaround time is 4 years except for those who have not been overseas in which case turnaround is 3 to 3½ years. Because of the current aviation reorganization in Germany, Cobra pilots may spend less than 4 years in CONUS.

Q: How can I get to a specific place overseas?

A: Fill out a DA Form 4187 (Personnel Action) and forward it as outlined in chapter 2, AR 614-30. Remember you must have 3 years onstation before you can be moved and a volunteer statement does not protect you from involuntary overseas assignment if it's your time to go. Incidentally, there must be a requirement at the place you want to go in order for you to be sent there.

Q: What can I do to get the CONUS post I want when I DEROS (date eligible for return from overseas)?

A: Put in a current preference statement 6 or 7 months before DEROS. Attach a note or letter to explain any special circumstances that you want to emphasize. Finally, call the assignment officer, but not until 90 days or less before DEROS.

Q: Can I get a military school enroute?

A: Those who have not received functional training in either an advanced aircraft or career track will be considered for an appropriate school in conjunction with their next permanent change of station (PCS). This procedure is necessitated by the limited number of available quotas which are used largely to support field requirements. Make your preferences known through a preference statement (DA Form 483) or letter. Your assignment officer will coordinate your schooling through the Professional Development Branch of Warrant Officer Division. Occasionally we do have quotas left over after assignments have been made. However, for the most part, these are administered to the various CONUS installations to meet their internal requirements.

Q: What about severe personal hardship? How can I be diverted from my current orders? How can I move to a specific place?

A: MILPERCEN must approve a compassionate or permissive assignment under the provisions of paragraph 3-3 or 3-2, AR 614-101. Your local personnel officer will help you get the required documents together. CW4 Valaer, Personnel Actions Branch, AUTOVON 221-7854, will process the paperwork in the Warrant Officer Division. He also is available for advice and assistance.

Q: What is the greatest advantage that an RA WO has over an OTRA WO?

A: In our opinion it's the fact that an RA WO has a measure of job security beyond 20 years of active service which is not available to the OTRA WO. The potential security provided for an OTRA WO by the Managed Tenure Program can be a fleeting thing since MTP needs are based on forecasted MOS vacancies and are not mandated in law as is the RA program. In other words, due to limited requirements by year group and MOS, the MTP may not be offered to a warrant officer; therefore, that person must retire at the end of 20 years AFS.

Q: Where do I send my Officer's Preference Statement (DA Form 483)?

A: Commander, MILPERCEN, ATTN: DAPC-OPW-AV, 200 Stovall Street, Alexandria, VA 22332.

We're sure this doesn't answer everyone's questions, but it's a shot at replying to some of the more frequent queries we receive. We realize your questions are triggered by legitimate concerns and uncertainties. So remember, we've got (or will get) the answers!

Hall Of Fame, '77

New inductees into the Army Aviation Hall of Fame are (L-R): Colonel Jay D. Vanderpool; Lieutenant General John Norton; Colonel Robert H. Nevins Jr.; Colonel Claude L. Shepard Jr.; Command Sergeant Major Lawrence E. Kennedy; Brigadier General Robert M. Leich; and Chief Warrant Officer Four Johnnie R. Sandidge. All are retired (photo by Debbie Caskey)

SEVEN MEN were inducted into the Army Aviation Hall of Fame 4 June at Ft. Rucker, AL, in observance of Army aviation's 35th birthday.

Major General James C. Smith, post commander, introduced the guest speaker, retired Lieutenant General Robert R. Williams, national president of the Army Aviation Association of America (AAAA). The association is the Hall of Fame's sponsoring agency.

General Williams emphasized that it is the Army Aviation Hall of Fame and not the Army Aviation Association Hall of Fame. He explained that Aviation Center commanders have made the Hall of Fame a major part of the aviation birthday celebration.

Those inducted into the Hall of Fame were chosen by a six-member Board of Trustees of AAAA. The new inductees are: Lieutenant General John Norton; Brigadier General Robert M. Leich; Colonel Robert H. Nevins Jr.; Colonel Jay D. Vanderpool; Colonel Claude L. Shepard Jr.; Chief Warrant Officer W-4 Johnnie R. Sandidge and Command Sergeant Major Lawrence E. Kennedy. All are retired.

CSM Kennedy is the first enlisted man to be inducted into the Hall of Fame.

Escorts for the honorees were Hall of Fame members: General Hamilton H. Howze, Lieutenant General Harry W. O. Kinnard, Brigadier General O. Glenn Goodhand, Colonel Delbert L. Bristol, and Colonel John W. Oswalt, all retired; Arthur Kesten, editor and publisher of The Army Aviation Magazine; and Ft. Rucker's Command Sergeant Major Robert L. Roots.

Each inductee and his escort came forward and the new member's portrait was unveiled. The portraits will be placed in the Army Aviation Museum section designated as the Hall of Fame alongside the 21 other members' pictures already on display.

General Williams presented James G. Craig, the Army Aviation Museum's acting curator, with a plaque which also will hang in the Hall of Fame. It is inscribed with the names of the 351 Hall of Fame patrons.

The birthday activities also included a static display on the Army Aviation Center Parade Field, rides in the UH-1 Huey simulators, the opportunity to see one of the world's largest hot air ballons, the radar laboratory used to train air traffic controllers and the parabolic screen used to teach navigational skills for nap-of-the-earth flying.

The day's formal events were concluded with an Honors Dinner at the Officers' Club. Attendees heard General Howze speak on the usefulness of helicopters and airmobility. General Howze is a pioneer in advanced concepts for airmobile operations and air assault doctrine.

The new inductees increased the Hall of Fame membership to 28.

ARCSA III

Continued from page 3

Figure 2

Attack Helicopter Companies

2 per Armored/mechanized division
1 per Infantry/airborne division
1 per Armored cavalry regiment
6 per Air Cavalry Combat Brigade (ACCB) (2 battalions)
3 per air assault division (1 battalion)

Attack Helicopters: Since ARCSA III was not a zero based study, the ongoing reorganizations in FORSCOM and the existing procurement schedules for attack helicopters were of significance.

In FORSCOM, 101st Airborne Division (Air Assault) reorganization created an attack helicopter battalion from attack helicopter assets in both of its 12-gun attack helicopter companies and the 36 attack helicopters in the aerial field artillery battalion. Also, efforts in the 82d Airborne Division were underway to increase the antiarmor capability by converting all attack helicopters to missile firing aircraft.

The overriding desire to increase aerial antiarmor capability in the divisions was included in ARCSA III, which recommended all attack helicopters be located in AHCs and ACTs. Therefore, attack helicopters were removed from all the assault helicopter companies. As a result, ARCSA III developed the structuring rules in figure 2 for attack helicopter companies.

Because air cavalry is important to all divisions, the structuring rules in figure 3 were developed for air cavalry troops:

Figure 3

Air Cavalry Troops

1 per Armored/mechanized division
3 per Infantry/airborne/air assault division (active) (1 squadron)
1 per Infantry division (reserve component)
1 per Armored cavalry regiment
3 per Air Cavalry Combat Brigade (ACCB) (1 squadron)

Figure 4

Combat Support Aviation Companies

1 per Armored/mechanized division
2 per Infantry/airborne division
1 per corps
6 per air assault division

To equip the AHCs and ACTs, ARCSA III proposed conversion of all AH-1G/Q HueyCobra helicopters to AH-1S. These can be equipped either with the TOW or used in the overwatch role, employing 2.75 inch rockets and a 20 mm interim turret. Also, integration of the AAH will be made using a schedule to maintain an overseas and CONUS AAH balance for rotation, stationing and training purposes.

When AH-1S conversions and AAH procurements are complete, enough assets will be available to equip both the active and reserve component AHCs and ACTs with preferred aircraft assets.

Scouts: The nature and mission of scout aircraft necessarily associates them with AHCs and ACTs. ARCSA III considered the OH-58C Kiowa (product improved OH-58) and the ASH. The ASH program was delayed 2 years to take advantage of increased technology in the aircraft. As an interim solution, UH-1H Huey aircraft equipped with the Target Acquisition and Designation System will be fielded and known as the Initial Target Acquisition and Designation Systems (ITAADS).

Utility Aircraft: These include the UH-1H and UTTAS. Reevaluation of ongoing UTTAS procurement plans showed them to be valid in light of other aviation reorganizations. ARCSA III increased the logistical role of the UTTAS by assigning UTTAS equipped units with a resupply mission to the heavy divisions, as well as assigning them to light divisions with a combat assault mission. The name of the assault helicopter company has been changed to combat support aviation company (CSAC) to better incorporate the tone of both missions.

ARCSA III found that a number of logistical resupply missions can be better performed by the UTTAS than by a heavier, larger helicopter such as the CH-47. To provide each division with an integrated logistic and resupply capability the following structuring rules in figure 4 were developed for CSACs:

CSACs in the armored/mechanized division will have a primary mission of logistical support, while CSACs assigned to the Infantry/airborne divisions will have a primary mission of combat assault. UTTAS aircraft also are scheduled both for air cavalry troops and helicopter ambulance companies and detachments in the active force.

Cargo Aircraft: Current programs provide for modernization of the CH-47 aircraft fleet and designation as the CH-47D. ARCSA III concurred with ongoing programs and recommended that the preponderence of the CH-47 fleet be in the active force in order to be deployed rapidly to forward areas. Consequently, ARCSA III recommended moving three CH-54 Flying Crane companies from the active force to the reserve components in exchange for moving three CH-47 units to the active force.

Both the CH-47D and CH-54 are considered to possess a medium lift capability. However, the CH-47 will be located in medium helicopter companies (MHC), the new designation for the old assault support helicopter company. The CH-54 will be in the heavy helicopter company. Figure 5 contains structuring rules for the MHC.

Medium helicopter companies have been increased in size from 16 to 24 CH-47s. This provides the

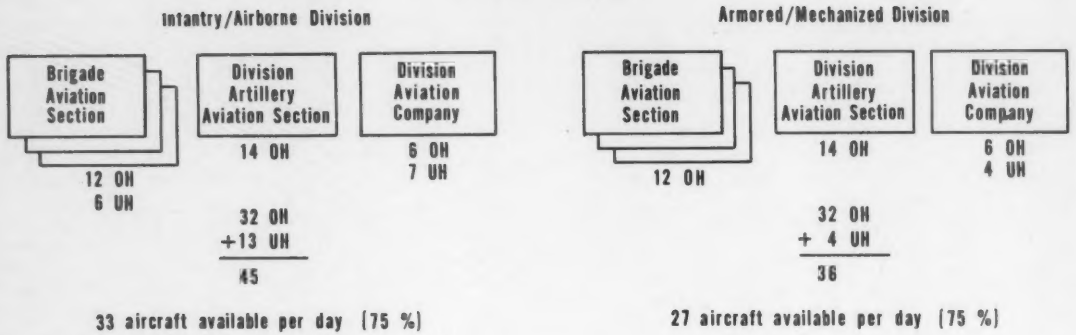
Figure 5

Medium Helicopter Companies

2 per corps
2 per air assault division
2 per theater (USAREUR)
1 per Air Cavalry Combat Brigade (ACCB)

Figure 6

Present Structure



MHC the capability to modularize the company into three eight-aircraft platoons to provide support to separate units or task forces as necessary while simultaneously increasing the aircraft availability within the company. Heavy helicopter companies are to be assigned to a theater on a specific mission or need basis.

Other Aircraft: ARCSA III also considered the military intelligence aircraft (OV-1B, C and D), and the elctronic warfare aircraft (RV-1, RU-21 and EH-1). It was found that ongoing studies concerning these aircraft generally are reasonable and in accordance with the Intelligence Organization and Stationing Study (IOSS). No changes in the current organization or procurement quantities were recommended by ARCSA III. Other aviation unit organizations studied by ARCSA III with their respective structuring rule are:

- Division Aviation Company, 1 per division.
- Combat Aviation Battalion, 1 per division.
- General Support Aviation Battalion, 1 per corps; 1 per separate brigade (Alaska/Canal Zone).
- Corps Aviation Company, 1 per corps.
- Army Aviation Company, 1 per Theater Army.

An ongoing study of helicopter ambulance companies and detachments is being conducted by the Health Services Command, Ft.

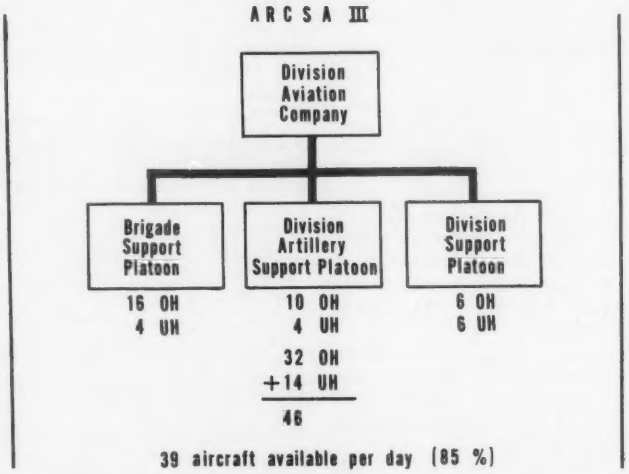


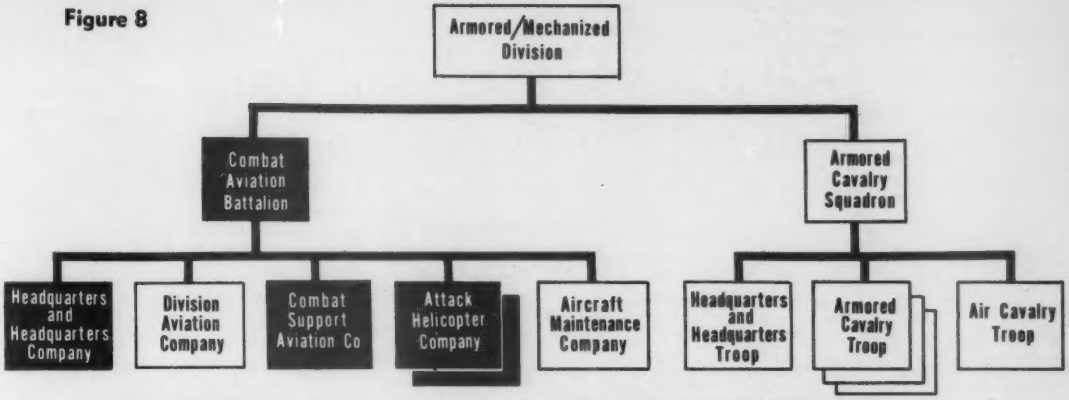
Figure 7 Signal Unit Consolidation (Example)

	UNIT	OH	BO1 UH	U-21
6	HHC Corps Sig Bn	1	5	—
1	HHC Sig Const Bn	5	—	—
1	HHC Sig Cbl Bn	4	—	—
2	HHC Sig Bd/Cbl Bn	2	1	—
11	HHC Army Sig Bn	1	—	—
2	HHC Army Sig Ops	2	5	2
2	HHC Army Sig Bde	—	2	1
10	HHC Sig Gp (Minus Abn Unit)	2	1	1
		54	56	16

Total: 126 Aircraft

5 HHC, Corps Sig Bde: 7 5 3
Total: 75 Aircraft
Saved: 51 (40%)

Figure 8



Sam Houston, TX. For this reason, ARCSA III did not make a recommendation concerning these units pending completion of these deliberations.

ARCSA III reviewed and "scrubbed" all TOEs containing aircraft to reduce the number of TOEs and to economize on aircraft personnel. Pooling aircraft in the division and at echelons above division was recommended. See figure 6 for the ARCSA III recommended division aviation company with the current divisional assets pooled. Figure 7 reveals, as an example, the reduction of TOEs at echelons above division by pooling Signal Corps TOEs to maximize aircraft availability and reduce overhead.

TDAs were studied to reduce the number of aircraft used in roles other than combat. This resulted in a 34 percent savings in aircraft in TDA positions. Training base requirements were included in the TDA evaluation and updated to reflect the most current training requirement and the projected training requirement for the new aircraft (UTTAS, AAH, etc.) entering the inventory.

What does all this mean to the division and corps structures? Figure 8 shows the armored-/mechanized division structure. Shaded areas indicate new organizations. All of these divisions are to be structured alike with aviation assets consolidated in a combat aviation battalion.

The CSAC has a primary logistics mission. Figure 9 shows the aviation structure of the Infantry/airborne division. Notice that there are two CSACs with a primary mission of combat assault and only one attack helicopter company.

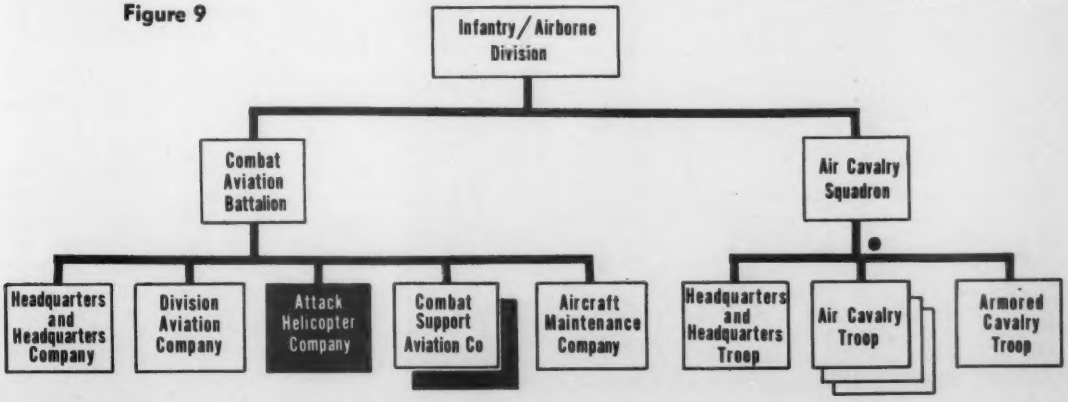
Implementation: How long will it take to make the Army actually look like this? Based on current plans, the entire ARCSA III force structure will be completed in the late 1980s. However, there are some significant milestones that are a little closer to the "now" timeframe.

Based on programed deliveries of AAH and AH-1S conversions we can:

- Provide AHC in all active divisions and ACR equipped with prime assets by mid to late 1980s.
- Provide AHC in reserve components equipped with prime assets by late 1980s.

By fiscal year 1979-1980 you will see through the Army aviation force the organizational structure shown in this brief article. The process of writing new TOEs for the new units already is underway and will be completed before the end of this year. Before you know it, ARCSA III will be a reality in your unit.

Figure 9



Who Says I Can't Kill You (Avoid My Environment)

Captain William J. Ely Jr.
Area Commander, Recruiting Force
Eugene, Oregon

I FEEL THAT I should warn you before it is too late. This article represents a betrayal on my part and seemingly classifies me as a traitor to my own kind, but I still question whether or not it truly represents a substantial reduction in odds, giving you the distinct advantage. This depends on your attitude and how seriously you interpret what I am about to say.

My skin is colored. As an individual, I alone possess the potential strength of inflicting serious injuries or – more than likely – killing you. Associated with others like me, our combined strength is unbreakable. Our growth during the past decade has been phenomenal. We have literally spanned almost every portion of the globe. As we continue to grow in both size and number so, proportionately, does the power that surges through us. We are too well established. We have existed too long already and will be around for centuries to come, so it is inconceivable that we will ever be eliminated. But, our growth and strength are only two of the advantages we possess.

We are inconspicuous. Our camouflage is natural. We have the peculiar advantage of being able to blend with almost any type of background. At night, we are invisible to the eye. Be it as it may, however, most of our victims are snared during the daylight hours. We rely solely on the element of surprise, our encounters being sudden, violent and devastating. Hardly aggressive, we prefer to wait in ambush, striking when you least expect it.

Finally, we possess a unique characteristic of reproduction. Any time one of us is torn down or destroyed – within days our damages have been repaired and we are generally much stronger than before. Fortunately for you, however, our replacements are much more recognizable.

As a rule, I and others like me prey on the naive – the uneducated. If you feel that you fall into this category, then you will probably literally run into me sometime. It is unfortunate, for I and other strands of wire too often are writing obituraries.

Army Aviation Accident Prevention Award of Excellence

Major John Kilkenny (right), commander of the 355th Transportation Company (Heavy Helicopter), received the Army's Aviation Accident Prevention Award of Excellence last May from Ft. Eustis commander, Major General Alton G. Post. The company earned the award by flying more than 6,000 accident-free hours in 74 months.

The unit has 25 aviators assigned, flying 10 CH-54 Flying Crane helicopters. During the 6 years since the company returned from Vietnam, it has flown a variety of missions including support for the *Argo Merchant* oil spill and recovery of downed aircraft. The CH-54 is the largest helicopter in the Army's inventory, capable of airlifting 25,000 pounds. (Army photo by David Byrd)

FLY, PLAN

Continued from page 9

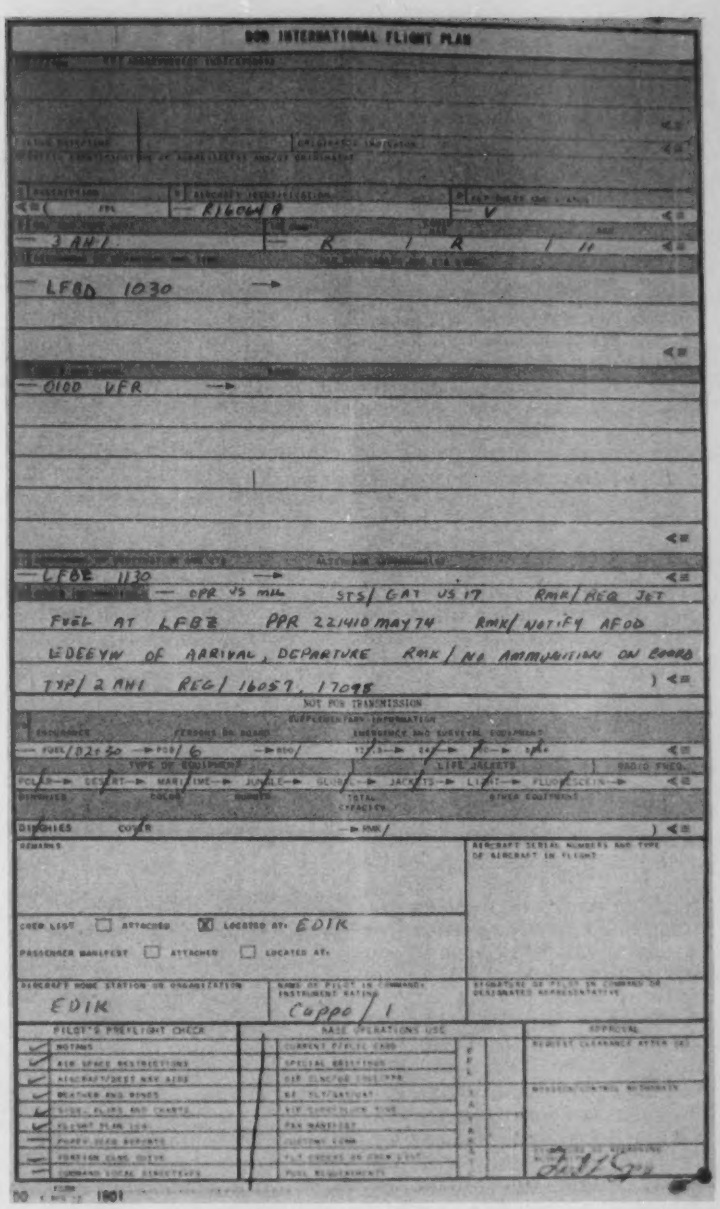
the catalog, you suddenly realize "what scale chart do I want?"

The scale of maps needed will depend particularly on the distance to be flown. As a guideline for long flights, a 1:500,000 scale probably is best. (Remember those NAVAIDs? They're great for helping pinpoint your position on those large-scale maps while flying VFR.) Aircraft type may influence the scale selected. A 1:250,000 scale map in an AH-1G for a noon to 1600-hour voyage might tend to clutter the cockpit.

While checking your route on the map, you should note if any part of the flight will be over mountains or water. Check the height of those mountains and consider the season and climatic trends before you cement your route. Over water, break out the flotation equipment and brief the crew on water emergency procedures.

Now dust off the DOD publication, Special Use Airspace, AP/2A – remember? The pub you picked up by accident when your IFR stuff was outdated. In this very important collection of paper and ink is a listing of every restricted area in Europe, Africa, and the Middle East. A check here should reveal any route deviations you might have to make to avoid any "no fly" areas. But it also gives limits (vertical and horizontal), operating times and controlling authority should a deviation be undesirable. Just maybe it will not be necessary.

It is inevitable, and it happens every flight. Time to research the enroute supplement, digging out the control frequencies, reading the aerodrome remarks and asking yourself some important questions. Is fuel available? Can I get an APU start? While reading the supplement, interesting things concerning your flight may come to light. For instance, the airport where you intended to refuel is open only 2 hours in the morning and 2 in the afternoon. Have you ever heard of fuel cash payment only? Read carefully, you might.


DOD INTERNATIONAL FLIGHT PLAN
LFBD 1030
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1801

A completed DD Form 1801 flight plan filed for an actual international flight

If possible, always call or teletype ahead, even the most current publication may contain erroneous data.

At this point, a few VFR arrival/departure routes or approach plates for foreign airports used as stopping points or destinations might be helpful. DOD may not publish the ones needed. Where are they available? Some of our allied countries publish a few of these, but chances are USAASDE will be able to obtain, and au-

See Glossary
Page 23

thorize use of, these for you.

So far, you've done pretty much what you might for any flight of considerable distance. The route is plotted; maps collected with the route drawn; NAVAIDs chosen; restricted areas noted; landing points researched; 2283 completed; and coffeepot empty. If this were not an international undertaking, all would be finished except the flight plan and the weather briefing. In this case make more coffee and start reading the FCG.

The Foreign Clearance Guide is must reading for international flying. Questions concerning border entrance requirements will be answered in the Guide. Will your flight be governed by diplomatic clearance, permanent overflight code or is 7 days notice required prior to entry? Are trilingual travel orders necessary? What are the custom regulations? Not only does the Foreign Clearance Guide impose certain requirements, it lists the costs of hotels, the current money exchange rate and what clothing to wear to negotiate the weather. Teletype and embassy addresses you might need to contact for information also are listed. There's another little hooker – note the remark 'see classified supplement.' Some sensitive info exists that may affect your flight, particularly birds with weapons systems onboard. That operations specialist can help you on that or put you in touch with the right folks.

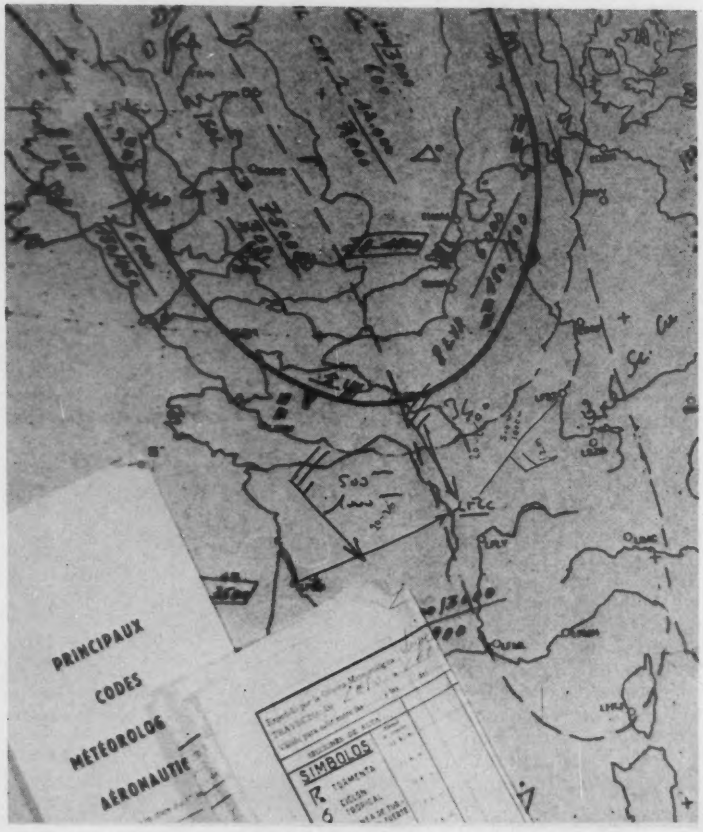
The whole thing is now communicated via DOD Form 1801 flight plan. The 1801, aptly entitled the DOD International Flight Plan, is used for all flights outside the local areas of Army airfields in the European area. The Army Flight Operations Detachment (AFOD) which monitors all U. S. Army aircraft in the Benelux countries – Denmark, Switzerland, Austria, Germany, and France – will send out all required PPRs on your request. However, since you may be unusual traffic to some foreign airfield, PPR all stopping points not only as a courtesy but as a precaution.

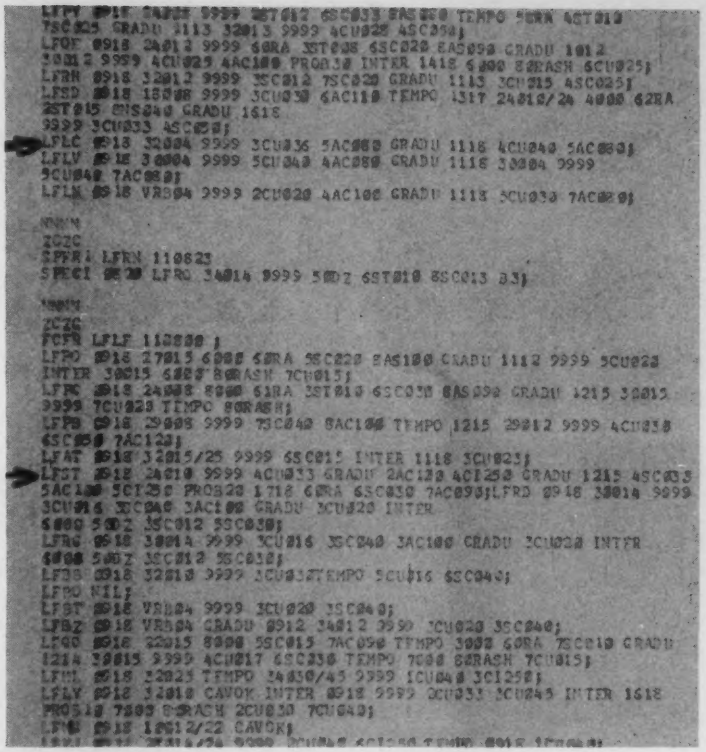
Actually, flying across friendly borders poses no difficulty but you will not want to become an international embarrassment. There are two steps to take to avoid mistakes in this phase. First, check the AP/2, Area Planning, Europe-Africa-Middle East under National and/or FIR UIR Procedures and see what special information is needed for crossing. Don't "bust" across the border; follow the procedures. The second step, though not required, may make things a little easier. If it's feasible and possible, stop at an airfield next to your intended crossing site and check out the local practice.

It's all done now. You call the CO and are asked about time and if you have checked the weather. A quick run to the weather desk and things look good. The aerospace environmental prognosticator outlines all the weather patterns in an easy-to-understand go/no-go language. What happens out of the jurisdiction of your friendly blue-suited weatherpeople?

Once on the road, your weather brifing is usually only as good as you are. A few foreign forecasters do not speak English and chances are you won't speak enough whatever to get a good briefing. There is a solution. Be familiar with and

A weather map, station report list and other weather information given to aviators when they requested weather briefings at foreign airfields. The forecasters did not speak English. This is the total briefing in most cases





Closeup of station reports written in accordance with the METAR code. It is important to have a TM 1-300, "Meteorology for Army Aviation," to interpret the reports when there is no English-speaking forecaster available

take along an FM 1-30, "Meteorology for Army Aviation." This FM explains the only internationally used weather code, METAR (Weather Aviation Routine). If you don't you may be surprised when you ask for a weather briefing and receive a stack of weather maps and station reports written in accordance with the METAR code. When this happened to a pilot we know, he resorted to drawing a picture of mountains which were in his flight path. The Spanish weather forecaster, who was briefing for a field in France, paused only a moment and then drew clouds through the aviator's artwork.

The METAR code may create some interesting conversation until you are accustomed to it. A flight of three Army helicopters landing at an airport on the French island of Corsica was cleared to land with the following instructions:

"Flight of three cleared to land, left hand, CAVOK" (pronounced Cav ok).

There was a short pause before chalk two queried lead on the interflight radio, about what the controller had said concerning the Cav. "I think he said the Cav is ok," was leads reply.

Chalk three added, "I don't know what they got against the Cav, but there's nothing in the Supplement that says we can't land."

Without further hesitation, lead returned the tower's call. "Understand flight of three cleared to land left downwind, and the Cav is ok."

As it turns out, CAVOK is a METAR term meaning the prevailing visibility is 10 kilometers or greater, no cloud below 1,500 meters (5,000 feet) and no precipitation or thunderstorms reported. No one said international flight wouldn't be enlightening.

International flight planning and flying is certainly one of the most interesting experiences an aviator can have. As an aviator in today's Army, you can probably count on one aviation assignment in the United States Army, Europe. The tour will present many interesting challenges and new learning experiences. Planning and flying an international flight may become only a small part of that tour, a secondary consideration in regard to an assigned mission. Accomplishing it, however, will attest to the professionalism and resourcefulness of the aviator, facing just one of the many challenges of Army aviation today.

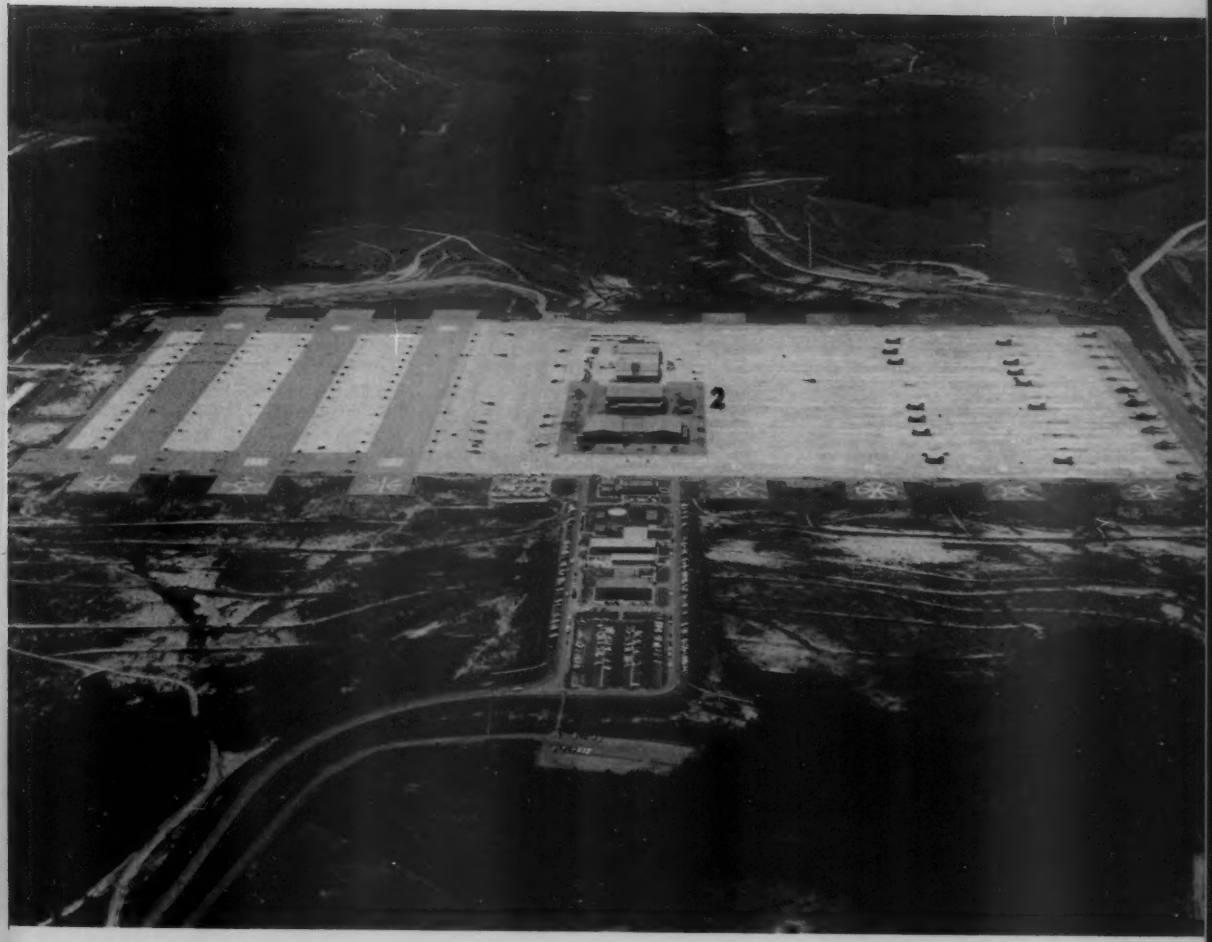
GLOSSARY

APU	auxiliary power unit
Cbs	Cumulonimbus
CO	commander
DOD	Department of Defense
FCG	Foreign Clearance Guide
FIR/UIR	flight information region/upper flight information region
IFR	instrument flight rules
IP	instructor pilot
METAR	weather information routine
NAVAIDs	navigational aids
PPR	prior permission required
S-2	intelligence officer
SIP	standardization instructor pilot
TM	technical manual
USAREUR	United States Army, Europe
VFR	visual flight rules
VIP	very important person

Army Aviati
At A Gl

Hatch stagefield (1) is the scene of primary program training in the TH-55 Osage. All TH-55 *first* solo flights are flown at Hatch. Hanchey (2) provides base field support maintenance for the initial entry rotary wing (IERW) program, home field for 100 TH-55s. Hanchey also supports the CH-47 Chinook advanced helicopter qualification (AHQ) and instructor pilot (IP) course and the CH-54 Tarhe IP course. Goldberg stagefield (3) is where the Department of Graduate Flight Training (DGFT) operates AH-1 HueyCobra and CH-47 IP qualification courses. Ech stagefield (4) bristles with IERW qualification flying in UH-1 Hueys, below. Left, an AH-1 performing nap-of-the-earth (NOE) operating in the area of Tabernacle stagefield.

ation Center
Glance, II



Pitot-Static Pitfalls

Barry Schiff
Trans World Airlines, Captain

Reprinted from the Aircraft Owners and Pilots Association (*AOPA*) *Pilot*

AN ACCIDENT investigator from the National Transportation Safety Board claims that *many* more fatalities are caused by pitot-static icing than is possible to determine.

With resigned frustration, he adds, "We often accuse a pilot of disorientation and loss of control when we know instinctively that the accident was really caused by erroneous flight data resulting from blocked pitot-static lines. But the ice usually melts before an investigator arrives at the crash site and the proof is gone forever."

A spectacular example of such an accident occurred in 1974 when a Northwest Airlines Boeing 727 was being ferried from New York's JFK International to Buffalo, NY. Although the aircraft was cleared to FL310 (31,000 feet), the ill-fated jetliner never reached its assigned altitude. At 24,800 feet, the trijet entered a spin and crashed only 83 seconds later (the average rate of descent was more than 17,000 fpm).

Were it not for the voice and flight data recorders salvaged from the strewn wreckage, it might have been inconceivable to conclude that such a disaster was caused by a simple, yet lethal overdose of pitot icing. But that's exactly what happened. And if a professional airline crew flying an elaborately equipped aircraft can fall victim to such a terminal fate, then so can the lone, general aviation pilot flying a less sophisticated machine.

The [Boeing] 727 pilots were deceived by erroneous airspeed indications. Because of ice-clogged pitot probes, both airspeed indicators behaved like altimeters and responded only to changes in altitude (for reasons explained later). During the climb, the IAS (indicated airspeed) increased steadily and persistently. This urged the pilots to raise the nose farther in an attempt to arrest what appeared to be a dangerously fast airspeed. The action resulted in an increased climb rate which compounded the problem. As altitude increased, so did indicated airspeed. The pilots continued to raise the nose until they had unwittingly forced the aircraft to stall.

There are three lessons to be learned from this accident:

- Always adhere diligently to appropriate checklists. (The 727 crew failed to turn on the pitot heat even though this item was on their taxi checklist.)
- When various instruments disagree, initially believe the one that indicates the most adverse condition. (Apparently, both artificial horizons in the 727 indicated properly at all times and reflected the dangerous 30-degree pitch angle prior to stall.)
- Distrust instruments that indicate performance beyond the capability of the aircraft. (Near the top of the 727's abbreviated climb, the pitot-static instruments indicated a continuous 5,000-fpm climb at an IAS of 340 knots, a generally impossible feat unless the airplane is caught in the violent updraft of a thunderstorm "chimney.")

We should not, however, be too quick to criticize the 727 crew for not recognizing their problem. Contradictory instruments can be totally bewildering.

During subsequent experiments in a simulator, several professional pilots were subjected to similar flight conditions and instrument indications. More than half of them fixated on the erroneous airspeed indicator while ignoring the properly functioning artificial horizon.

Surprised? You shouldn't be. When a pilot takes his first flying lesson, he begins to develop the deep-seated habit of observing and reacting to airspeed indications. The IAS gauge becomes his primary key to survival. Later, he is introduced to the artificial horizon, a relatively complex device that is more subject to mechanical failure than the simpler, more reliable airspeed indicator. It is little wonder that – in a pinch – pilots revert to airspeed.

Figure 1 is a diagram of the pitot-static system typical of most general aviation aircraft. Its purpose is to provide static (ambient) air pressure to the altimeter, vertical speed indicator (VSI), and airspeed indicator as well as to provide pitot (ram air) pressure to only the airspeed indicator.

Many pilots are of the impression that two static ports (one on each side of the fuselage) are provided for system redundancy. Not so. Otherwise, considerate airframe manufacturers also would provide a backup pitot tube because this item is most prone to icing, for example. Dual static sources are *necessary* and equalize (balance) pressure variations that occur on both sides of the fuselage when the aircraft yaws (such as during turbulence).

To determine the effect of having available only one static source, for example, I enlisted the aid of noted aviation attorney Robert Cleaves. In addition to owning a Cessna 185 that would be ideal for simulating various types of pitot/static difficulties, Cleaves is an experimental test pilot.

Prior to our first flight, we placed masking tape over the right-hand static source. During the subsequent climb, all instru-

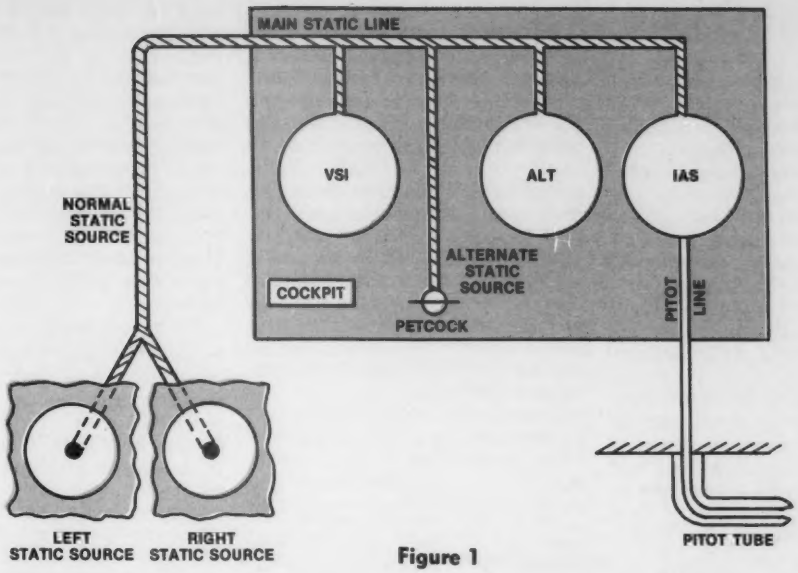


Figure 1

ments functioned normally, using air pressure from the left-hand static source.

After leveling at 4,000 feet, Cleaves alternately stabbed at the left and right pedals at which times the three pitot-static instruments behaved erratically. Why they did so is not mysterious.

During a yaw to the right, the only operational static source (on the left) was turned partially into the relative wind. This allowed the airstream to blow into that static port which increased the pressure in the static line and was interpreted by the altimeter in this instance as a loss of 400 feet. Also, the VSI indicated a substantial sink rate and the indicated airspeed dropped 15 mph. (The behavior of the IAS is explained later.)

Conversely, during a yaw to the left, the open static source was on the "downwind" side of the fuselage and sensed a decrease in pressure. As a result, the altimeter rose, the VSI indicated a climb and the IAS increased.

In turbulence, the three instruments were extremely sensitive and fluctuated wildly between high and low indications.

Should all three of these gauges act similarly during a normal flight, the odds strongly favor that one static port is clogged. By yawing the aircraft and observing the readings, a pilot can determine which of the two static sources is plugged.

Prior to a second flight, *both* static sources were covered with tape to simulate heavily iced static ports. During the takeoff roll, everything seemed normal. But during the climb from sea level to approximately 5,000 feet, the VSI remained at zero and the altimeter insisted we were still on the ground. The IAS gradually decreased from 90 mph at sea level to about 60 mph at 5,000 feet even though attitude and power settings remained constant.

Since the static sources were sealed at sea level, sea-level pressure was trapped in the static lines and prevented the VSI and altimeter from sensing an altitude change.

Totally blocked static sources are extremely hazardous. Without an altimeter, how can a pilot execute an IFR (instrument flight rules) approach or maintain an assigned altitude or remain clear of obstacles?

At such a time, a pilot has two choices. The most obvious one is to use the alternate static source. This is simply an extension of the main static line that is routed into the cockpit to where it is within reach of the pilot. This tube is sealed with a petcock so that cockpit air cannot normally enter the static system. However, when the normal static source is blocked, the petcock can be opened to introduce cockpit air to the static instruments. Since the air pressure in an unpressurized cabin is nearly the same as the ambient pressure outside the aircraft, this restores reasonable accuracy to the pitot-static instruments.

These instruments, however, will not be quite as accurate as when the normal static source is used because ambient pressure in the cockpit varies slightly with airspeed, attitude and the positioning of ventilation controls.

When the vents are open, for example, air rushing into the cockpit tends to pressurize the cabin. This increased pressure is sensed by the altimeter as a lower altitude. Closed vents, on the other

Pitot-static Pitfalls

hand, often result in cabin air having slightly less pressure than the air outside and results in a higher than true altitude indication.

When using the alternate static source during an IFR approach, open the vents fully, no matter how cold it is outside. In this way, the altimeter probably will read lower than true, a safeside error.

Unfortunately, many light planes used for IFR are not equipped with alternate static sources. This is ludicrous. When pilots can spend thousands of dollars on electronic redundancy, it is totally illogical for them not to invest 40 bucks to install an alternate static source and provide a backup supply of static air for the *single most important IFR device: the altimeter.*

Lacking an alternate static source, a pilot with an ailing static system has an emergency alternative: break the glass on the face of the VSI. Doing so allows cabin air to flow into the instrument and then through the normal static system plumbing to the altimeter and airspeed indicator. But when breaking the glass, try to do so without damaging the needle.

Cleaves' 185 has an alternate source. So, with the normal static ports still sealed at 5,000 feet, the petcock was opened and all three instruments sprang to life. After the needles stabilized, we closed the alternate source which "froze" the static system at 5,000 feet. As the flight continued, there was no way to detect gradual altitude changes. A subsequent steep, intentional descent was detected only by a significant increase in airspeed and noise level. As we leveled off a few hundred feet above the Pacific, the altimeter and VSI were still at 5,000 feet.

Many pilots contend that if icing conditions are so severe as to clog up the normally ice-free static sources, then unusually heavy structural icing would have created an earlier emergency. This is not always true because static sources are subject to other, more insidious forms of icing.

Take, for example, a pilot who flies after a recent rain or after his aircraft has been washed. Water droplets and/or condensation in the static lines will freeze after climbing to a sufficiently cold altitude – in VFR (visual flight rules) or IFR conditions. Bugs, dirt, wax and blowing sand are other culprits that attack the credability of the static system.

These latter items can *partially* clog a static system, a particularly hazardous condition because the symptoms are difficult to detect and vary according to the degree of blockage.

To simulate this condition, we retaped the static ports and poked very small holes in the tape to allow only a restricted flow of static air pressure to the instruments.

During the climb, we noted that the altimeter and airspeed indicators were lagging and indicated less than true values; also, the VSI indicated less than the actual rate of climb. This was because the static pressure outside the aircraft changed faster than could be sensed through the pin-pricks in the masking tape used to cover the larger static ports.

After leveling off, the instruments slowly caught up and indicated correctly.

The danger of partially blocked static lines was accented during descent: the IAS was higher than actual, the lagging altimeter indicated higher than actual and the VSI indicated less than the true rate of descent. We were deceived into believing that we were safer than we really were.

One way to combat this problem is to temporarily open the alternate static source at least once during every IFR descent. If the needles move significantly when this is done, a static pressure problem exists and the alternate source should be used during the remainder of flight.

Figure 2 is a simplified diagram of the airspeed system and is useful in analyzing IAS errors resulting from partially/fully blocked pitot-static air sources.

When ram air enters the pitot tube, it flows into a sealed diaphragm within the airspeed indicator housing that expands with increasing pitot pressure. It is the expansion and contraction of this diaphragm that causes the airspeed needle to move. The ram air entering the pitot tube actually consists of two types of pressure: the static or ambient atmospheric pressure of the air surrounding the airplane and the *dynamic* pressure of the air caused by forward motion.

To prove this, consider an airplane at rest. Static air pressure enters the pitot tube and the diaphragm. Since the diaphragm is filled by static air pressure, why doesn't it expand? Because static pressure – from the static ports – enters the case of the instrument and surrounds the diaphragm. Since the pressure inside the diaphragm is then equal to the surrounding pressure, the diaphragm is "relaxed" and indicates zero airspeed. (For the airspeed indicator to work properly, static air pressure must be allowed to enter the case of the instrument to counteract the static – not the dynamic – pressure that enters the diaphragm through the pitot tube in flight.)

Assume that an airplane is in a steady climb during which the entire pitot tube freezes over with ice. The air in the diaphragm is trapped. But, as the climb continues, the static air pressure surrounding the diaphragm decreases. This reduction in surrounding pressure allows the diaphragm to expand and causes the IAS to increase even though the actual airspeed remains constant.

Conversely, during a descent without pitot pressure, the static pressure in the instrument case increases and compresses the diaphragm resulting in a decreased IAS.

In this manner, the airspeed indicator behaves like an altimeter and was the problem encountered by the 727 crew mentioned earlier.

Many pitot tubes are provided with a drain hole (see diagram) to allow water to leave the system.

Assume that the main pitot entrance is clogged but the drain hole remains clear. What then? Static pressure then only will enter the diaphragm through the drain hole, pressure exactly equal to the static pressure surrounding the diaphragm. As a result, the diaphragm "relaxes" and the IAS drops to zero.

To prevent icing, pitot heat should be used *at all times* when flying in visible moisture. Also, turn it on before takeoff if there's a chance that taxiing through a puddle might have splashed the probe.

Frequently check the operation of the pitot heat on the ground by feeling the pitot probe. But don't grab it. A properly operating heater will heat the tube sufficiently to burn the unwary. Also check the tube – before every flight – for foreign matter that might clog the works.

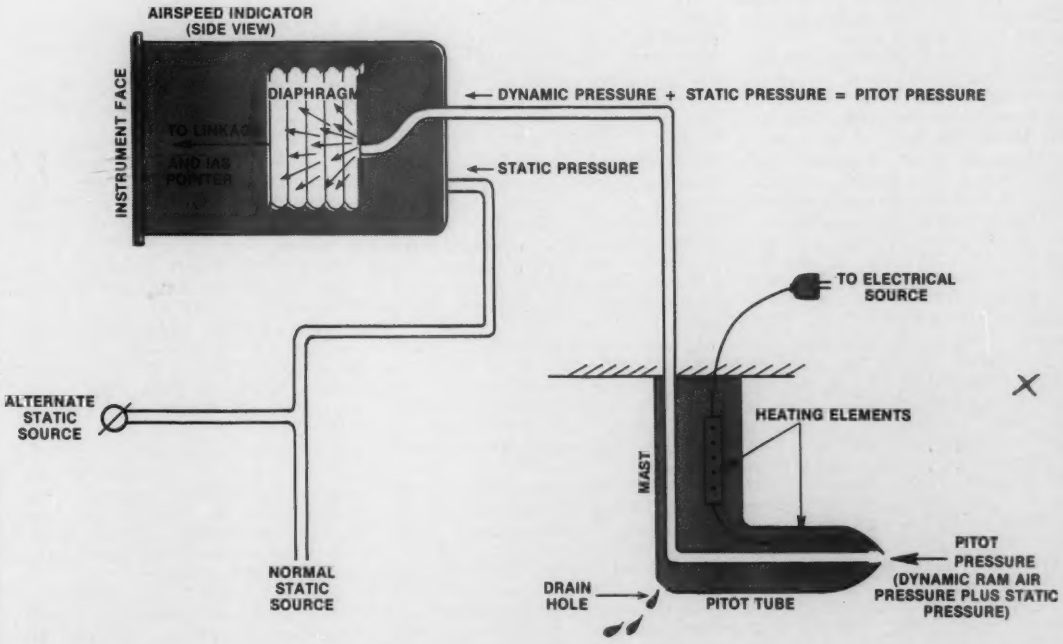
Unless the static source of an airplane is located on the pitot probe, an iced-over pitot does not affect altimeter and VSI indications. A static system that is not free and clear, however, does affect IAS even when the pitot is clear.

Assume the static ports are blocked during a climb. As a result, static pressure surrounding the diaphragm does not decrease as it should. The diaphragm, therefore, cannot expand as much as it should and the IAS indicates a lower reading than it should.

Conversely, during a descent the static air pressure surrounding the diaphragm does not increase as it should. Resultantly, the diaphragm expands more than it should and the IAS indicates a higher reading than it should.

When a pitot or static source becomes impaired, the instruments can present a bewildering display of flight data. The best preparation for such an emergency is to understand the system and know how to interpret its messages.

Figure 2



The *DIGEST* thanks the *AOPA Pilot* for permission to reprint Barry Schiff's article. It appeared in the November 1976 issue of the *AOPA Pilot*

VIEWS FROM READERS

Continued from page 1

timely articles and information.

The U. S. Army Aeromedical Research Laboratory (USAARL) is queried regularly about the hazards of static electricity and Nomex uniforms. I'd like to pass on some tips that have proven useful.

Master Sergeant Bill Bailey's article on "Static Electricity," mentioned static electricity buildup in uniforms, but did not provide a remedy except grounding. Since Nomex should only be washed and never drycleaned, it is a simple task to add a fabric softener/ antistatic agent to the final rinse water. If dryed in a dryer, one of the spray or paper impregnated softeners should be added. The result will be a uniform that is relatively free of static electricity. Unfortunately, commercial or quartermaster laundering does not provide this protection.

Captain Dan R. Popham's article, "Army Aviation Gas Mask," was very disturbing. It upset, especially, those who have and are struggling so hard to urge the development of an aviation specific gas mask. Aviators wear helmets, night vision goggles, helmet-mounted sights and a plethora of other special equipment that prevent rapid donning of any available standard or "converted" ground Soldier's gas mask. *The ABC-M-24 Mask is a get-me-down-and-no-more!* To be operationally effective, you must know you have a cloud of noxious stuff to fly through so you can trade off control of the aircraft with your copilot while doffing your helmet and donning your mask. Incidentally, the helmet, night vision goggles, etc., now need refitting to fit over the mask straps. CPT Popham makes the statement that, "...The ABC-M-24 protective gas mask can be used effectively and safely to ensure the survivability of aircraft and aircrewmen...." He is correct and quite candid in his listing of the deficiencies of this mask in the aviation environment. But I submit that these deficiencies are so serious that they represent a distinct threat to mission accomplishment and even influence safety during crisis situations. These deficiencies make certain missions, i.e., medevac hoist missions, impossible. Inadequate depth perception and visual distortions and restrictions make station holding and precision hover movements difficult. The hoist operator has a *life* on the end of a cable and he can't afford visual errors. The nausea and headache problem described by CPT Popham, as well as high "drag" or resistance to respiration make use of the mask by aircrew and by medevac patients hazardous; especially, above 5,000 feet MSL regardless of the AGL. We have a long way to go! I am disappointed that CPT Popham's one statement implies that the M-24 satisfies Army aviation safety and mission requirements. The rest of his candid article does not support that statement.

COL Stanley C. Knapp
Dir, Bioeng & Life Spt Equip Div
USAARL
Ft. Rucker, AL 36362

Sir:

Flight instruction must be approached with the attitude that aviators have unique strengths and weaknesses and because of this we can learn from them as well as teach them.

We as instructor pilots are essentially the same in experience and ability as other Army aviators. Our only added asset is that we have learned the techniques and methods of instruction. But there is more to it than just knowing the techniques and methods.

Good flight instructors must possess qualities other than flying ability and a Method Of Instruction certificate. Each must have a sense of responsibility, infinite patience, and an agreeable personality. But an individual may be a superb pilot, possess the aforementioned qualities and still not be able to instruct.

In our day-to-day dealings with aviation matters, it is not enough to know the parts of the aircraft, the maneuver requirements and the pilot's name. We are dealing in personalities as well as effective flight instruction.

We were taught in training not to exceed aircraft limitations or our own capabilities. It was constantly stressed to exercise sound judgment, maintain patience and use the positive approach. Experience has taught us to develop perceptions into insight and teach from the known to the unknown. All these techniques and concepts are ours to employ, something we have control over. What about the one point we cannot control? That's right – the other guy – the aviator with whom we are flying.

The human element is the weak link in the flight instruction process. No amount of explanation, demonstration, practice, or review will work if the aviator is not receptive. Personalities fall into many different and complex categories too numerous to mention. It is important to realize that due to unique personalities the behavior of aviators differs in given situations. Conscientious flight instructors, learning from the aviators with whom they fly, eventually will realize this.

I have modified Murphy's Laws somewhat and included them as "Hartwick's Axioms." They represent some of the absolute feelings I have experienced as a flight instructor.

- No aviators are so predictable or reliable that at one time or another they won't do something completely unpredictable.
- In any given flight situation, anything that can go wrong will go wrong.
- Left unattended, these things always go from bad to worse.
- With the possibility of several things going wrong, the one that will go wrong will be the one that does the most damage.
- If everything seems to be going well, you have obviously overlooked something.
- If you can remain calm in all the confusion, you obviously don't understand the situation.

Our ultimate objective concerning instruction is to identify with the individual personality so that the aviator's behavior can be conditioned to respond appropriately for any given situation.

As a result, our responsibilities as flight instructors are much greater than often realized. No two aviators are alike and the same approach or method of instruction will not always be effective. This is when we must become flexible and adapt our teaching techniques to fit each aviator. Effective instruction can only occur by analyzing the aviators and remembering that they are individuals with unique personalities. If we fail in our responsibility to identify with the aviator's personality, all the instruction in the world will not produce the desired results of training.

Unfortunately, some instructors view training as nothing more than repetition and critique. They can tell you what is wrong, what caused it, and how to correct it. But sometimes this is not enough. Sometimes the reason for error is totally unrelated to the maneuver or the act of flying. This implies that the instructor must have an in-

sight into the aviator's psychological makeup.

Currently, instructor pilots receive an introduction to psychology during the academic portion of their training and this helps them realize that each person is a highly complex personality and must be handled as a unique individual. But the real test is the actual application.

Take the opportunity as often as possible and observe other aviators while you are flying with them. Develop your understanding of human behavior by a continuous application of the techniques of instruction and above all observe the paraphrase of the Golden Rule – teach others as you would like to be taught.

CW2 Dwain Hartwick
Warrant Officer Advanced Career Course
Warrant Officer Career College
Ft. Rucker, AL 36362

Sir:

In December 1970 General Dynamics submitted a proposal for an air-launched missile for attack helicopters. The proposal was submitted 7 months after the U.S. Army completed its project analysis concerning air-to-air combat for attack helicopters. Both the proposal and the project analysis supported the feasibility of arming attack helicopters with an air-to-air weapon capability.

Vietnam, which had served as an active environment for the development of new systems for helicopters, was in its final phases. One of the more demanding tests of airmobility in a high threat environment came in the spring of 1971. The assault into Laos demonstrated the helicopter's survivability. However, a threat exists today that was not present then – the threat of air-to-air conflict.

The current threat which supports the need for an air-to-air capability has received superficial notoriety. The Mi-24 Hind represents an awesome threat for those who may have to face it on future battlefields. According to a Czechoslovakian aviation magazine it was "...designed on the basis of technical specifications similar to the S-67 BLACKHAWK."

The Soviets have embarked on a costly program which has brought its helicopter inventory to a figure of approximately 2,500. This has been accomplished in a relatively short period of time without benefit of testing their product in a combat situation. Instead, they could easily capitalize on the success of the helicopter demonstrated by the U.S. in Vietnam.

It is readily accepted that the Soviets train using tactics similar to tactics used by the U.S. It is also readily accepted that Soviet helicopters can be expected to use similar employment techniques. One of the more obvious is the use of weather to increase survivability.

Weather historically has been a key factor in the outcome of battles. European weather has and will continue to dictate how the battle will be fought. Current U.S. field manuals emphasize that, "adverse weather reduces visibility also reduces the effectiveness of attack helicopters; however, low ceilings may favor attack helicopter employment." Further "extreme weather conditions may limit the use of attack helicopters; however, close air support, both enemy and friendly, will have been severely limited or terminated long before helicopters are forced to stop flying."

What kind of weather phenomena can we expect in Europe? According to the U.S. Air Force Weather Service, ceilings of less than 200 feet, with visibility of less than ½ mile, can be anticipated between 0300-0800 hours from 28 to 32 percent of the time during the months of September and October.

The preceding paragraph outlines a "worst case" example of flying weather. Ceilings of less than 1,000 feet, with visibility of less than 2 miles, can be encountered from September through March from 17 to 38 percent of the time.

European weather will favor employment of attack helicopters, U.S. and Soviet. High performance aircraft will present a minor threat to attack helicopter operations while the helicopter versus helicopter threat will be a significant one.

Unlike the Soviets, Army aviators are restricted by regulation in flying during periods of limited visibility. Even more significant is the limited exposure of U.S. aviators to European weather phenomena. The Soviets can well be expected to capitalize on this advantage. It is also within the realm of reality that they would capitalize on developing an air-to-air weapon system to defeat an opponent who lacks the defense.

The most effective system to defeat the attack helicopter threat is a system which can operate under the same weather conditions, over the same terrain, have the same characteristics concerning flight maneuverability, and, most importantly, have the appropriate weapon to engage and destroy the enemy.

Until the combat developments community can justify a need for an air-to-air weapon system, commanders have a responsibility to fill the gap. It is essential to train crews to defend themselves against possible attack by other helicopters. Training should include procedures for crewmembers to maintain visual alertness for enemy helicopters and evasive maneuvers should be practiced. Hopefully an adequate defensive weapon system will be fielded before it is realized in a combat situation that we are behind our enemy in the field of helicopter weapon technology.

MAJ Robert C. Knight
U.S. Army ROTC Instructor Gp
Norwich University
Northfield, VT 05663

Sir:

In the March 1977 issue of the *AVIATION DIGEST*, your article "Minimizing N-PER-REV Vibrations," page 34, contained the following statement: "The techniques described used on every approach would definitely *reduce* mean time between failures."

Unless I'm mixed up you want to EXTEND or lengthen time between failures.

What is your opinion?

Carl W. Strever
Chief, Aircraft Section
Fort Lewis Maintenance Division
Fort Lewis, WA 98433

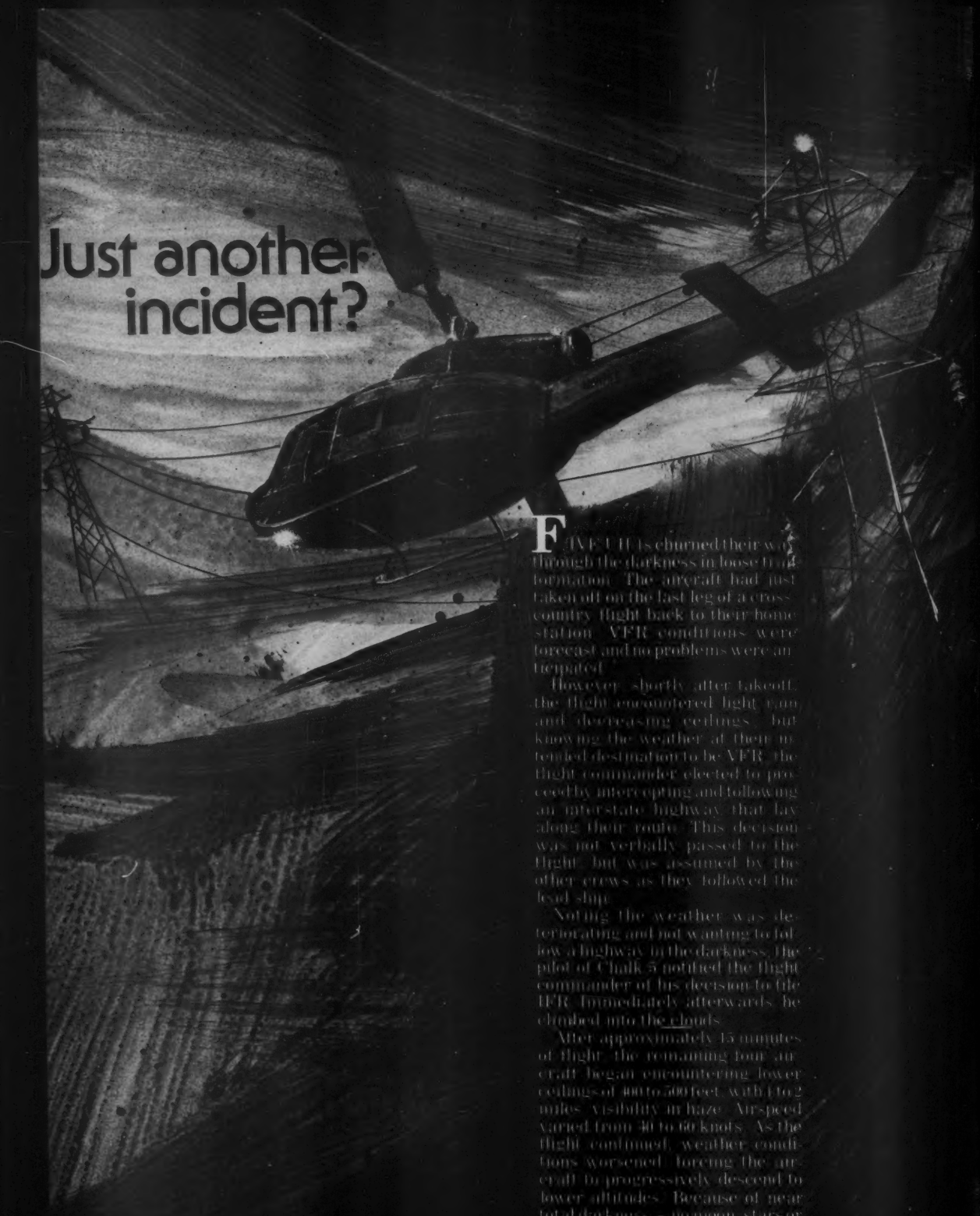
• You are right. We want to EXTEND—not reduce-time between failures. That's what the introduction to the article should have stated.

Sir:

Kudos to the U.S. Army Aviation Center! Major Thomas' article on training literature, "New Horizons Revisited," Nov 76 gives me the opportunity to laud the Center's efforts in effective use of the print medium. The Aviation Center was one of the first to implement the new approach to presenting training information. The staff has learned quickly and its products are among the best being published.

The team concept for production is being proven valid by the Aviation Center. The team's professional attitude and pride in work could well serve as an example to other preparing agencies. The reader of the new manuals may never understand the effort necessary to bring the latest information in a readable, usable format, but I'm sure he appreciates it.

LTC Paul B. Minton
Ch, Training Literature Div
Ft. Eustis, VA 23604



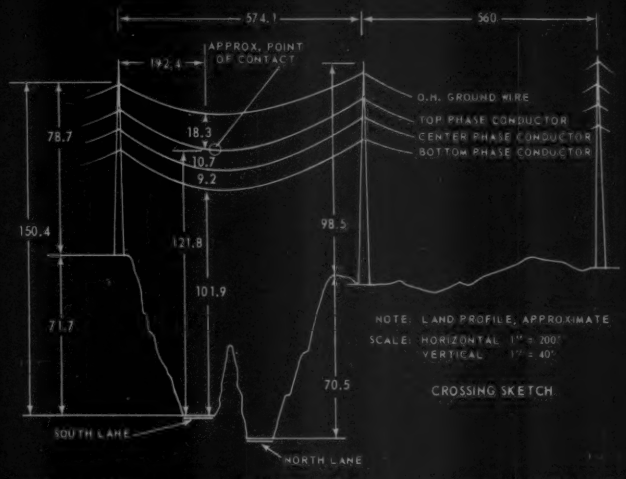
Just another incident?

FIVE UH-1s churned their way through the darkness in loose trail formation. The aircraft had just taken off on the last leg of a cross-country flight back to their home station. VFR conditions were forecast and no problems were anticipated.

However, shortly after takeoff, the flight encountered light rain and decreasing ceilings, but knowing the weather at their intended destination to be VFR, the flight commander elected to proceed by intercepting and following an interstate highway that lay along their route. This decision was not verbally passed to the flight, but was assumed by the other crews as they followed the lead ship.

Noting the weather was deteriorating and not wanting to follow a highway in the darkness, the pilot of Chalk 5 notified the flight commander of his decision to file IFR. Immediately afterwards, he climbed into the clouds.

After approximately 15 minutes of flight, the remaining four aircraft began encountering lower ceilings of 400 to 500 feet, with 1 to 2 miles visibility in haze. Airspeed varied from 40 to 60 knots. As the flight continued, weather conditions worsened, forcing the aircraft to progressively descend to lower altitudes. Because of near total darkness – no moon, stars or



nearby towns to provide illumination – the crews found themselves totally involved in maintaining visual contact with the highway and could not accomplish a constant map reconnaissance for obstacles.

Suddenly, while about 120 feet agl, the lead aircraft smashed into a 66,000-volt powerline that spanned the highway, snapping the cable in half. Almost immediately Chalk 3 and Chalk 4 climbed into the clouds and went IFR while Chalk 2 remained low level to observe the lead ship. After ensuring the lead aircraft was under control, Chalk 2 also elected to climb IFR.

Despite the copilot's insistence to either land the aircraft or climb immediately, the flight commander remained low level until he could ensure the aircraft was responding normally. Then, he too went IFR, continuing flight to his intended destination. Although one aircraft landed at an alternate airfield, all five completed the flight without further incident. On landing, inspection of the lead aircraft revealed incident damage to the flow fin, chin bubble, antennae, cross tubes, and searchlight. Just another incident.

But was it? Let's take a closer look. To begin with, it was miraculous, to say the least, that the wire strike did not result in the immediate loss of both aircraft and personnel. Although the cable was 1½ inches in circumference, it did not contact any critical aircraft component, and gave way by breaking without destroying the integrity of the aircraft. It was even more miraculous that contact with this particular wire was made in the manner described, considering that to strike the wire, the aircraft had to fly beneath two other wires either of which could have made contact with the main or tail rotor. As a matter of fact, investigators determined that the *maximum* separation between the tail rotor and the uppermost wires was approximately 3½ feet. Finally, the occupants were fortunate that no critical structural or control member sustained any initial damage that could have caused loss of control or in-flight breakup during the latter portion of the flight following the mishap.

In addition, the sudden, unplanned manner in which the flight of aircraft entered IFR conditions could have readily resulted in a midair collision. Fortunately, none of these events occurred. But this was not a case of "just another incident." The results could have been catastrophic; so the important question is what caused this mishap?

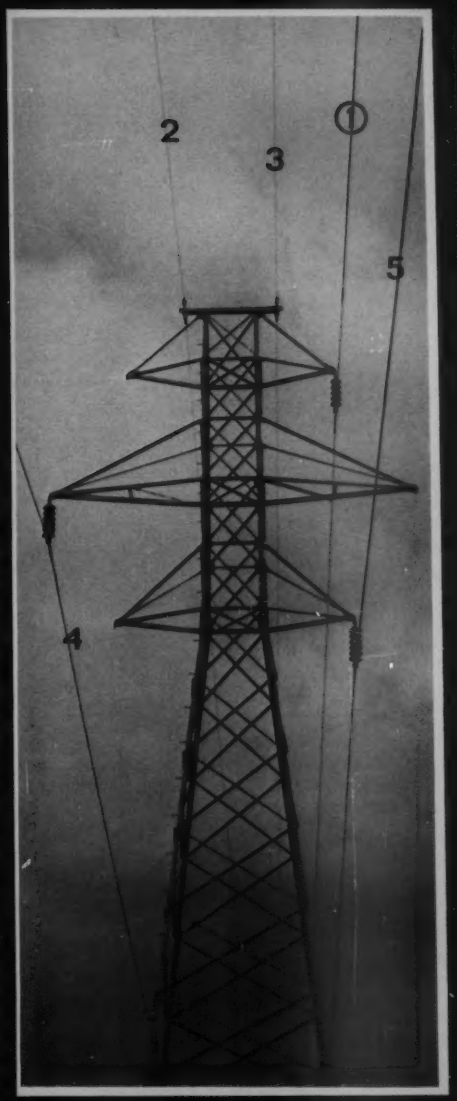
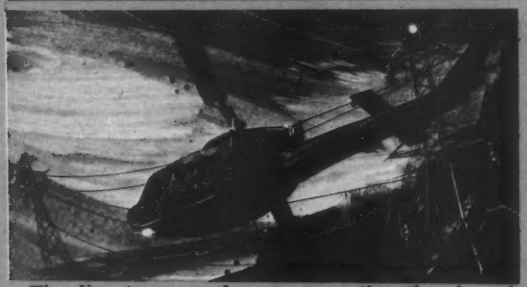


Photo shows closeup of tower supporting the wire that was hit (1). Distance from (2) to (1) at the pole is 6 feet. From (1) to (4) is approximately 15 feet. Due to the large span between towers the wires had enough sag to allow the aircraft to pass below wires (2) and (3) and above (4) and (5).

USAAAVS



The direct cause, of course, was that the aircraft was being operated at an altitude insufficient to clear all obstacles in the area. But let's back up a bit. Before departing on the final leg of the cross-country flight, the flight commander had no indication of possible problems, and he neglected to plan in advance for some contingency. Consequently, he did not give his flight an updated briefing – an omission that was to strongly influence his decisions during flight.

When the flight initially encountered light rain and a lower ceiling, the flight commander probably felt justified in electing to follow the highway. Although he had not updated his VFR sectional map to show all the wire hazards present, he had flown this route approximately a month earlier and knew of them. He also knew the highway led to their home field where the weather conditions were known to be VFR. In the absence of any other plan, he made his first decision.

However, shortly afterwards he was forced to make a second one – to continue following the highway or to go IFR. At this point of the flight, weather was obviously deteriorating and ceilings lowering. Visibility was restricted and haze prevented use of searchlights. Already, Chalk 5 decided IFR was the answer and had gone that "route." The other aircrews also felt that they should execute inadvertent IMC procedures, but did not do so because of a strong feeling that the "integrity of the flight" should be maintained. Although the copilot of the lead aircraft felt strongly that they should proceed IFR, excessive radio traffic prevented him from trying to convince the flight commander to take this course of action.

Once again, a lack of prior planning influenced the flight commander's decision. He knew they were about 40 miles from their destination where weather conditions were VFR, but he was uncertain as to whether or not all the pilots in the other aircraft were instrument qualified and current. Consequently, he elected to continue following the highway – a decision that resulted in the wire strike.

After the mishap occurred, he was left with one final decision: land or continue. He knew the terrain was extremely hazardous. This, coupled with the near-total darkness and poor visibility brought on by the inclement weather, resulted in his decision to continue flight after he ascertained the aircraft was responding normally – a lucky guess.

What would you have done under the same circumstances? Obviously, a long-winded discussion with pros and cons could readily develop. But the real point is not so much the course of action the flight commander in question elected to take but rather *that the major decisions would have already been taken care of had thorough planning and briefing of all the pilots been accomplished — before the flight.* One portion of the recommendations concerning the mishap makes this point quite clear: "...That commanders ensure all aviators are familiar with all requirements in AR 95-1, with special attention given chapter 4, paragraph 4-1, c, e, i – 'preflight action for all flights will include a careful evaluation of the following: appropriate charts and maps, *alternate course of action if flight cannot be completed as planned,* and routes, obstructions, hazards and equipment requirements.' "

Another recommendation admonishes flight leaders and aircraft commanders to insist on radio discipline so that meaningful transmissions can be aired.

In conclusion, we may note a touch of irony. Along the route followed by the flight of aircraft, high tension lines cross the interstate highway at 14 points. Only one – the fourth set of wires – is depicted on the current VFR sectional map. That was the set the aircraft struck.

I knew that was the point of no return

WHEN FLYING at treetop level, any emergency which causes complete or partial power loss will almost certainly result in the aircraft settling into the trees before operator's manual emergency procedures can be initiated. CW3 Marion F. Standridge recently received the Broken Wing Award for the way he dealt with a partial power loss at treetop level. USAAAVS personnel interviewed Mr. Standridge to find out how he successfully coped with the situation.

USAAAVS: Tell us about your emergency and what your reactions were.

STANDRIDGE: We were cruising at 90 knots and 50 feet above the trees on a UH-1H training mission when I noticed a decrease in engine noise and a substantial decrease in engine and rotor rpm. At the time of this indication, the student pilot was on the controls and we were over tall trees and rugged terrain with no available landing area to our right, left or front. I took the controls and my initial reaction

CW3 Marion F. Standridge graduated from flight school at Fort Rucker in July 1969 and was assigned to Vietnam. He then trained Vietnamese student pilots at Hunter Army Airfield for 2 years. He is presently with the 14th Company, U.S. Army Aviation Center, Fort Rucker, AL, with primary duties as an IP for the Department of Undergraduate Training.

was to roll the throttle back on, because I have had students get tense on the controls and reduce the throttle. This failed to correct the situation, so I then started trading off airspeed for altitude. I slightly reduced collective pitch, but rpm continued to decrease and the needles remained joined.

When engine rpm reached 6000 and rotor rpm about 295, I knew that was the point of no return. The only alternative was to either regain rpm or go into the trees. I then put the governor switch into the emergency mode but still didn't get any immediate reaction. So I further reduced collective and the rpm slowly started to increase. Once rpm reached 6400, I flew to the nearest field and, fortunately, landed without damaging the helicopter.

USAAAVS: Did the aircraft yaw when you first noticed a loss of rpm and engine noise?

STANDRIDGE: Not enough that I could tell. However, the student pilot could have automatically corrected for it.

USAAAVS: Did you look at your N_1 speed?

STANDRIDGE: No. I was too close to the trees to worry about N_1, but I did look at the rotor tachometer and primary instruments.

USAAAVS: Did you or the student switch the governor on?

STANDRIDGE: I did, eventually. When I initially brief my students, I always tell them that if we should get an indication of engine failure during terrain or NOE flight to put the governor switch in the emergency mode as soon as I tell them. However, I had just picked up this student and failed to brief him on this technique. So when I told him to go to emergency, he instinctively reached for the transponder.

USAAAVS: Did you roll the throttle to the flight idle position?

STANDRIDGE: Negative.

USAAAVS: Did you have any surging of the engine?

STANDRIDGE: None.

USAAAVS: You stated there was a lag before the governor took effect. Did you increase or decrease the throttle to get the rpm back into range?

STANDRIDGE: I think it was probably a combination of both. I still had a small amount of power in the system and when I went to emergency I reduced the throttle slightly because I thought I would get an overspeed. The rpm sort of hung where it was so I decreased the collective a little more and rpm started increasing with pitch and throttle application.

USAAAVS: When you have a fuel control failure and lose power, the N_1 turbine speed decreases. When you go to emergency governor and minimum fuel flow there is an initial lag while the N_1 turbine regains it speed. For this reason, an overspeed or overtemp will not occur immediately if the throttle is not in the flight idle position. As the N_1 regains its speed, it will be necessary to reduce the throttle to control the N_1 speed and prevent an overspeed. That's the reason for the curiosity about your N_1 speed. Also, a delay in the aircraft regaining rpm can be expected when the N_1 has been reduced significantly. If you are going to lose the engine and possibly the aircraft it won't make a bit of difference if you get an overspeed or overtemp.

You mentioned you tell all your students to be prepared to go to the emergency governor if there is an indication of an engine problem at NOE altitude. I realize this is not in the dash 10. What do you base this on?

STANDRIDGE: IP technique and the fact that if the engine fails you are going down anyway. Right? But if you still have partial power, you have a chance to salvage the aircraft.

USAAAVS: Is this standard procedure among your entire training branch or is it just something you do personally?

STANDRIDGE: Well, it should be standard but it is just one of my personal techniques.

USAAAVS: In your opinion, do you feel that switching to the emergency governor position should be standard procedure for power loss while in the NOE environment?

STANDRIDGE: Why not? If you have a low-side governor failure, you have a chance of salvaging the aircraft, whereas if it is an engine failure you are going down anyway.

USAAAVS: Since you fly every day, do you believe this would be a justifiable emergency procedure?

STANDRIDGE: Definitely.

USAAAVS: Do you feel you were actually flying NOE or contour?

STANDRIDGE: We were terrain flying at 50 feet above the trees.

USAAAVS: Fortunately, you weren't flying NOE and had airspeed you could trade for altitude to provide the needed time factor. If you had been flying at 40 knots it would have been a different story.

STANDRIDGE: We would have probably gotten at least some blade strikes.

USAAAVS: First of all, there is less ability of the system to maintain altitude at 40 knots as opposed to 80 knots. If you lose power at 40 knots, you will actually experience a decrease in altitude because you don't have enough airspeed to trade for altitude.

How much time would you say elapsed from the time you first detected a failure until you were once again in controlled flight?

STANDRIDGE: It's going to be a guess because it was hot and heavy after I decided what was going on. I'd say no more than 6 seconds. That is from the time that I rolled the throttle back on and decided that it wasn't an error on the student's part.

USAAAVS: You said you were at 90 knots when the emergency occurred. What was your airspeed once you were back in control?

STANDRIDGE: About 60 or 65 knots.

USAAAVS: So you traded off about 30 or 35 knots.

STANDRIDGE: Like you mentioned, at NOE you don't have that airspeed to trade off.

USAAAVS: Did you lose any altitude or were you still at approximately 50 feet after the aircraft was brought under control?

STANDRIDGE: Try about half of that.

USAAAVS: A very important factor here is that in low-level flight, pilots are taught to maintain at least 90 knots. If you ever have engine failure at 50 knots during low-level flight you're going in the trees. Would you agree with this?

STANDRIDGE: I definitely would.

USAAAVS: The salvaging factor for you is that you had airspeed to trade off, which gave you that element of time necessary to effect an emergency procedure.

STANDRIDGE: Had we been at 50 knots and by the time I realized what was going on, we would have probably made a successful autorotation into the trees.

USAAAVS: Then you feel that, more or less, the key that allowed you to recover the aircraft was your airspeed plus you were mentally prepared for what you would do in the case of a failure?

STANDRIDGE: Well, as soon as I realized that it was not the student pilot, I checked out the trees. When the airspeed reached 60 or 70 knots and the rpm got down to the bottom of the green, I was prepared to go either way.

USAAAVS: One of the important things we are trying to point out here is that you mentally prepare your students so that in the event of a failure you have crew coordination and the students know what you expect them to do. This is very important for successful recovery during an emergency. If you had never talked to the students and only had 5 or 6 seconds to react, you know there is no way for them to understand what you are talking about.

STANDRIDGE: This particular student is like all students who aren't briefed. When you say emergency, they instinctively go to the transponder. But as I said earlier, I had failed to brief him.

USAAAVS: Well, there may be a conflict in the student's mind because one of the emergency procedures requires that you switch to the transponder. That is, of course, if time permits. So this has to be made clear to the students before NOE or terrain flying.

STANDRIDGE: The dash 10 contains about eight emergency procedures which aren't applicable to terrain flying and especially NOE. I think that chapter 4 of the dash 10 should be reviewed and procedures incorporated for terrain and NOE flying.

USAAAVS: Thank you, Mr. Standridge.

EJECT

DOES THE SIGHT or sound of the word EJECT cause a queasy feeling, or one of uncertainty? Granted, very few OV-1 flight crews look forward to an ejection, but with few exceptions, the 78 Army crewmembers who have ejected successfully will tell you they would not hesitate to eject again. Use of an ejection seat is a mental attitude based upon equipment knowledge and recognition of the need to eject. A negative mental attitude could prove fatal.

Take that ejection seat you Mohawk crews have been sitting on for all those hours. Have you thought much about it? Do you really know how it works? Could you recognize a malfunction and be able to take responsive and proper corrective action? The ejection seat isn't nearly as complicated as the aircraft or mission equipment you operate each day.

USAAAVS
Don Heyden
Fixed Wing Branch, Maintenance Engineering Division
Directorate for Maintenance
U. S. Army Aviation Systems Command

But when it's time to eject, you will be better prepared if you have symptomatic recognition and preconceived corrective actions mentally recorded for timely use.

The improved MK-J5D ejection seat is a relatively simple device which has been proven by extensive testing to be very reliable when activated within its design capability. The single most important act *you* can perform is that of recognizing the need to eject; the lower your flight altitude the quicker the decision to eject must be. A general rule of thumb would be: "In *controlled* flight" the decision can be delayed until reaching 5,000 feet above the terrain. However, " in *uncontrolled* flight" the decision should be made immediately. The 5,000 feet of altitude will allow ample time to initiate ejection remedial action, should it ever become necessary. However, before you can take remedial action, you must better understand the equipment and its performance characteristics. Therefore, let's briefly review the principal devices used and their design functions.

DROGUE GUN: The drogue gun ballistically extracts the drogue parachute from the ejection seat head-box one-half second after ejection.

DROGUE CHUTE: Stabilizes the ejection seat in preparation for main parachute deployment and forcibly withdraws the main parachute from the pack.

TIME RELEASE MECHANISM: Releases the occupant restraint points and allows the main parachute to be extracted by the drogue parachute system at a safe altitude and airspeed. These functions occur one and three-quarters of a second after ejection below 14,000 feet.

BAROSTAT: A five-stack metal aneroid which senses altitude and, by expansion, blocks the time release mechanism gears from operating until the seat has descended through oxygen-deficient altitudes.

MANUAL OVERRIDE: The linkage which, when manually activated, will mechanically release the occupant restraints, ballistically cut the main parachute withdrawal line, and allow manual deployment of the main parachute should the time release mechanism ever malfunction. The manual override system can also be used for emergency ground egress or water ditching.

Ejection posture is very important for a back-injury-free ejection. Back injury (i.e., a small chip or crack on the edge of the vertebrae) is caused by the vertebrae coming in contact with one another as a result of body dynamic slump induced by the ejection forces. The more nearly vertical the spinal column, the greater the spacing between vertebrae, and the lesser the probability for back injury. Therefore, the shoulders and head should be positioned full-back against the seat when the appropriate firing handle is pulled. Introduction of the rocket-assisted MK-J5D ejection seat, with its attendant lower ejection G forces, greatly reduces the potential for an ejection back injury.

Improper harness adjustment is the greatest contributing factor to an ejection back injury. The natural tendency is to overtighten the vertical adjustment straps, causing the spinal column to become bent forward and thereby predisposing the spinal column to compression injury. Therefore, pay particular attention to adjusting the harness before flight. Adjustment should be accomplished in a seated position. Pull down on each vertical adjustment strap until a slight pressure is felt across each shoulder. Check fitting numbers on each adjustment strap for uniformity and future fitting reference.

The new fitted parachute/restraint harness was designed to eliminate the potential for spinal bending due to improper adjustment. Initial fitting of the sized harness was performed by knowledgeable personnel, but their efforts can be negated by changes in body size and/or addition of flight clothing under the harness. Therefore, always be conscious of the basic fitting principle "shoulders full back with a mild snug feeling across the shoulders." If the harness feels too tight, find a buddy with the next larger size harness and try it for fit. If it feels and looks proper, order a new harness. A new harness is cheaper than the loss in duty time which could result from an unnecessary ejection back injury. Remember, also, the harness release fittings should be positioned so the inertia reel "loop strap" holds the shoulders against the back cushion when you are sitting full back in the pre-ejection position. Adjusting the release fittings will position the "split roller yokes" so they are not too low nor too high, alleviating discomfort across the base of the neck.

The ejection seat lapbelt also plays a significant role in reducing ejection back injury. We are all

familiar with lapbelt crash restraint, but on the ejection seat the lapbelt also provides lower body restraint so the torso cannot slide forward nor slip under (submarine) the belt during the ejection dynamics period. Lack of positive lower torso restraint will allow bending of the lower back and loss of separation between the vertebrae during ejection G loading. A simple method of determining proper lapbelt fit is to try scooting your buttocks under the adjusted lapbelt. If you can move, more tightening of the lapbelt is required.

Now let's narratively accomplish a moderate altitude ejection for performance characteristics and remedial action review. The first and most important knowledge for the ejection is your altitude. Without knowing your altitude at the time of ejection, you are guessing from the very start.

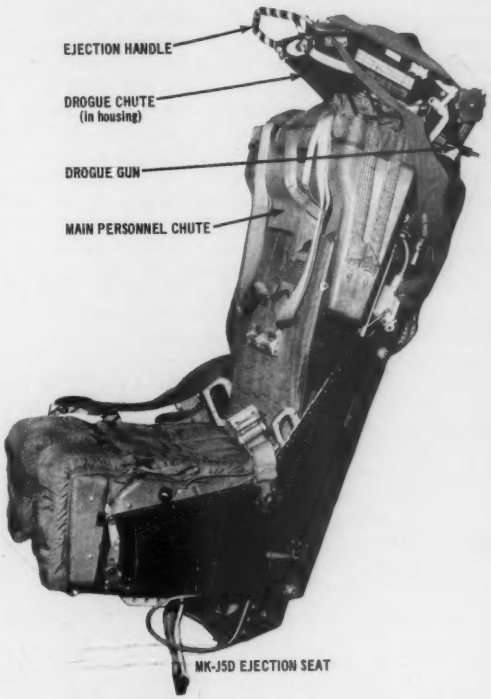
PRE-EJECTION PHASE: Alert your crewmember of the need to eject, and jettison the overhead hatch (time permitting). The vast majority of OV-1 ejections are through the hatch, so don't hesitate if time is critical (i.e., low-level or uncontrolled flight). The ejection handle to be used is dependent upon the flight condition and the "ejection-decision-altitude." Activation of the face blind requires approximately 2 seconds more than the lower firing handle. Therefore, the quickness of the lower firing handle activation is recommended for takeoff, final approach, and/or low-level type ejections. The nearness of the lower firing handle to the hands is very important in G force ejections caused by out-of-control flight. Under the influence of G forces, physical control of the arms is greatly reduced and grasping of the face blind handle is difficult and time-consuming.

Good pre-ejection body position can be assured by forcing your body back into the seat by pushing on the rudder pedals (observers push against the floor). Don't worry about your feet or legs. They will be forcibly pulled back against the seat bucket forward edge by the leg restraint lines and because of the "knee-bending" action caused by the upward acceleration of the seat. Press your head and shoulders firmly against the seat cushions, and pull the firing handle.

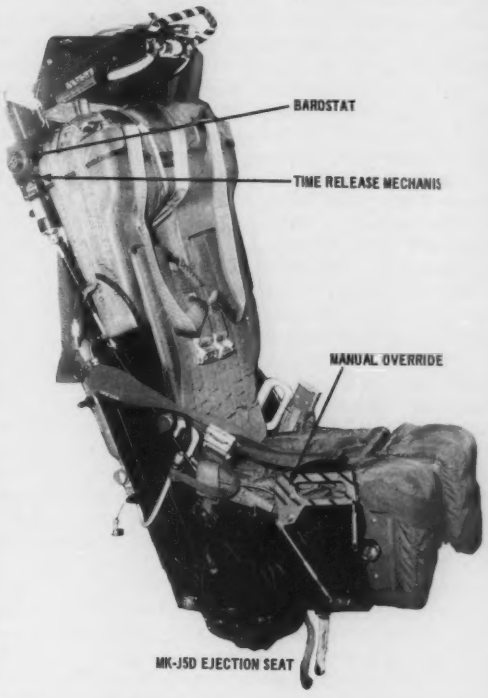
The occasion could arise which would require rudder and hand control of the stick during the pre-ejection phase. Under such a flight control condition, the lower firing handle should be pulled with the free hand. Here, too, as the seat begins to rise, the leg lines will pull the feet towards the seat bucket forward surface, a complementary action to the knee-bending motion. The extended arm and hand holding the control stick will come to a rest position across the leg thigh area as a result of the natural shoulder motion induced by the vertical accelerations and will be G-force-restrained as the seat exits the cockpit area. If you are ejecting at 200 knots or faster, both hands should be used to initiate the ejection. In this case, the wind blast caused by the aircraft speed will cause "flailing" of the arms if they are not restrained by gripping the wrist of the hand used to pull the lower firing handle or by using both hands to pull the face blind.

SEAT FAILS TO EJECT: The most probable cause for this condition is failure to pull the face blind to full out. This could be the result of being too timid so, when pulling the face blind, be sure to press your body firmly into the seat, and use your shoulders as a pressure point for forcibly pulling the face blind. If pulling the face blind fails to initiate ejection, retain the face blind with one hand, grasp the lower firing handle with your free hand, and pull upward. *Do not* release the face blind once it has been pulled because wind blast will "flail" the face blind. This can cause injury or possibly foul the drogue parachute deployment. Pulling and releasing the lower firing handle will not cause any problem because of the limited firing cable "run-length."

DROGUE PARACHUTE FAILS TO DEPLOY/INFLATE: This is the first occasion for knowing the altitude above the local terrain at the time of ejection. The first half second after initiation of the ejection is beyond recollection by almost everyone who ejects. Your first perceptible feeling should be that of a stabilized upright falling, with a decelerating positive G force in the seat-of-your-pants caused by the inflated drogue parachute or the opening jolt of the main parachute. If your first perceptible feeling is that of tumbling, *do not panic*. Count to five. If the tumbling continues, and your ejection altitude was greater than 4,000 feet above the local terrain, initiate a manual override and separate from the ejec-



MK-J5D EJECTION SEAT



MK-J5D EJECTION SEAT

tion seat. After separating from the seat, continue holding the left parachute riser up near the pack with your left hand, grasp the ripcord handle with your right hand, and pull hard. This two-handed act is required because the parachute is free to move and the parachute pack ripcord pins and D-ring handle require a restraining force to allow them to be removed from the pack.

If your ejection was initiated below 4,000 feet above the local terrain, initiate the manual override, but pull the ripcord concurrent with the twisting parachute removal act while you are still in the ejection seat. Remember, the parachute D-ring cannot deploy the parachute unless the parachute pack has been pulled free from its stowed position on the seat back. This is a very risky method for main parachute deployment, and should be used *only* for a malfunction at low altitude.

MAIN PARACHUTE IS NOT EXTRACTED BY DROGUE PARACHUTE: As with a malfunction of the drogue system, knowledge of the altitude at the time of ejection is essential. Below 14,000 feet the main parachute should be extracted by the drogue parachute within 2 seconds from the ejection initiation. The initial ejection events are occurring so fast that your first perceptible recollection may be the drogue deceleration forces or the opening jolt from the main parachute inflation. When the drogue parachute deploys, the ejection seat will stabilize in an upright position and you will feel the drogue deceleration forces. If this condition is ever experienced, and your ejection was initiated below 14,000 feet, *do not panic*. Once again count to five, and, if the main parachute still has not deployed, initiate a manual override in accordance with previously discussed procedures.

HIGH-ALTITUDE EJECTION: An ejection *above 14,000 feet* presents some variations to the aforementioned remedial actions. If an ejection is necessary at higher altitudes, it is critical that you know your altitude above sea level. During a high-

altitude ejection, the barostat will block the running-gears on the time release mechanism, thereby preventing deployment of the main parachute until the set altitude is "descended through" by the seat and occupant. The descent will be stabilized by the deployed drogue parachute because the drogue system operates without regard to altitude. Each ejection seat occupant will produce minor differences in the descent characteristics of the drogue-stabilized ejection seat. The usual characteristic of an MK-J5D drogue-stabilized descent is that of a rocking chair motion. Occasionally, after a long descent from 30,000 feet, a spin may begin due to aerodynamic forces acting on the seat and occupant profile area. If a spin does begin, *do not panic*. Attempt to control the spin by extending one foot away from the edge of the seat or extend an elbow away from your body. *Do not* release your leg restraints and *do not* release your handhold. If the face blind was used for the ejection, move it to one side so you can see, but *do not* release it because of the windflailing previously discussed. The drogue-stabilized ejection seat will descend at a rate of approximately 150 feet per second. Therefore, during the drogue descent from high altitude, check your watch for a point of reference. A one-minute (9,000 feet) or two-minute (18,000 feet) drogue descent is very worrisome for the person who does not have confidence in the ejection seat automatic features. Consequently, know the ejection seat characteristics and the prescribed emergency procedures.

A malfunction of the drogue system at high altitude is recognized by the tumbling and unstable characteristics previously discussed. If this malfunction occurs, initiate the manual override procedures with deliberate action. Staying with the tumbling and spinning ejection seat for an extended period is not recommended due to the possibility of loss of consciousness caused by reduced blood flow to the brain induced by the unstable descent. *Do not* attempt to deploy the main parachute while still seated under these unstable conditons because the chute can possibly foul on the seat structure, and inflation could be blocked. Therefore, accomplish a total separation from the seat before initiating the parachute D-ring pull as previously described.

The basic design of the ejection seat main parachute system is not compatible with long free-fall sky-diving techniques. During free fall, the parachute pack will trail behind approximately 2 feet as a result of the parachute riser extensions which connect to the canopy release fittings located on your parachute harness. DOD test jumpers have stated that the fiberglass pack is so aerodynamically unstable that it "flails about your body" to the extent that injury could result. Therefore, always grasp the left riser near the pack with your left hand before exiting the seat during a manual override. Remember to hold tightly to the riser because wind blast/drag will tend to pull the pack out of your grasp when it is removed from the seat-back assembly. Additionally, loss of the ejection seat emergency oxygen at high altitude necessitates deployment of the main parachute in a timely manner. After main parachute deployment, a state of semiconsciousness may be experienced due to lack of oxygen at the higher altitudes (20,000 feet and higher), but full consciousness will be restored as the inflated parachute descends through the lower altitudes.

A malfunction of the time release mechanism at altitude is the most difficult to detect correctly. Under the stress of ejection, the relationship of real time is lost. Seconds pass like minutes, and minutes pass like hours. Therefore, if a malfunction of the time release mechanism is suspected during stabilized descent above barostat release altitude, *do not panic*. Count out loud to 30, or check your watch for a 30-second lapse of time. If the main parachute still has not deployed, initiate the manual override procedures previously discussed. Even better, if you mentally recorded the altitude of cloud layers, this information can be used for reference.

DUAL EJECTION: Ejection from a Mohawk above barostat release altitude produces the condition for an unnecessary manual override. The barostat is an assembly of ten metal discs, soldered into five capsules. Therefore, each barostat has a performance variation. Consequently, any two barostats installed on any two ejection seats will release the time release mechanism "running-gears" at a different altitude. A maximum of 1,500 feet difference could exist between the two barostat assemblies. To demonstrate this normal characteristic, suppose two Mohawk occupants eject simultaneously at

14,500 feet. Most probably one barostat will block the time release mechanism "running gears" and prevent deployment of the main parachute. The barostat in the other occupant's time release mechanism could be pressure altitude retracted, thereby allowing deployment of the main parachute. Conceivably, this deployment of the main parachute could be witnessed by the other crewmember, who has not yet reached the release altitude of the barostat installed on his time release mechanism. Under the stress of ejection, or because of unfamiliarity with ejection seat system characteristics, an unnecessary manual override could be initiated as a result of normal tolerance variances. If you should ever experience this condition, *do not panic*. Count to 10 before initiating corrective action. The normal rate of descent of the drogue-stabilized ejection seat (150 feet per second) will allow the loss of about 1,500 feet during the act of counting.

Another characteristic of ejecting from the Mohawk is that of rocket motor exhaust inside the cockpit. During MK-J5D qualification testing, the condition of one occupant ejecting while the other remained in the cockpit was successfully demonstrated without injury to the live occupant who remained in the cockpit. The ejection seat rocket motor ignites after 63 inches of seat travel up the catapult gun. Therefore, the rocket exhaust is directed downward into the cockpit area. This design characteristic causes the cockpit to become filled with nontoxic smoke, but tests showed this smoke will clear in a very short time and never obscures the cockpit instruments. However, if such an ejection were to occur at night, the remaining occupant would temporarily lose night vision due to the rocket motor flash. Therefore, should the situation ever arise where the observer ejects unintentionally during flight, close your eyes to maintain night vision and protection from cockpit dirt. Additionally, hold your breath for a short time to prevent inhaling the rocket exhaust during the initial period when the exhaust is the greatest.

LOW-LEVEL EJECTION: This ejection condition requires the quickest decision and reaction of any we have discussed. During the takeoff/climbout and approach/landing spectrums of flight, a mental preparedness must be established to decrease the time to initiate the ejection. In low-level ejections, time is the essential factor necessary for a successful ejection escape – time to recognize the need to eject, time to pull the ejection handle, and time for the ejection seat automatic functions to occur. Under descending flight conditions, time represents a loss of altitude, and under unstable flight conditions, such as torque-roll or wing stall, time represents a loss of altitude caused by unusual attitude. Two of these time factors are within your control: (1) Recognizing the need to eject and (2) initiating the ejection in the most rapid manner (i.e., lower firing handle.)

A significant portion of this article has been addressed to emergency corrective action procedures. These procedures have been cited to fill a possible void in ejection escape knowledge which is essential to positive reaction. The information presented has been consolidated from experiences of test personnel and the escape system technical community. Think about what's been said here and discuss it with your buddies. Above all else, mentally experience the characteristics and the happenings for ready reference if ever required.

The ejection seat in your Mohawk has been installed and maintained at great expense to the Army. The true value of this investment is in your hands. Know when and how to use it. Establish your own preconceived conditions for ejection escape and verify your decision points, using the MK-J5D performance envelope presented in the OV-1 Operator's Manual. Throughout the evolution of ejection seats, statistics have shown over and over again that the single most contributing factor to fatalities has been delaying the decision to eject until essential time/altitude was no longer available for successful parachute recovery.

For more information on the MK-J5D ejection seat, contact Mr. Don Heyden, USAAVSCOM, AUTOVON 698-3015, commercial (314) 268-3015.

Continued from page 7

A PREPLANNED ACCIDENT TO TEST A PREACCIDENT PLAN

simulated accident and were asked to conduct themselves as though an actual accident had occurred. Security was set up by the police and a rescue unit from the fire department responded for the casualty in the rear of the aircraft. The rescuers were told only that the crew chief had a severe head injury and before losing consciousness had complained of severe pain in his back. The rescue unit extracted the injured crew chief, provided immediate first-aid treatment, and took him to a local hospital. Hospital personnel had been advised that a mock accident would be taking place and that they were to simulate the treatment of the casualty and be as realistic as possible. The crew chief "died" about 2 hours after the crash before boardmembers could question him.

Within 20 minutes after the "crash," an aircraft from the flight activity was seen in a search pattern that was part of the unit's preaccident plan. The aircraft landed and a crewmember came to lend assistance to the crew of the downed aircraft. At that point, unit personnel were told that a simulated accident had taken place and to conduct themselves as though a major accident had just occurred.

Damaged parts brought to the scene were laid out in the area surrounding the aircraft. Chalk was used to mark the aircraft to indicate where structural failure or major damage had occurred. Within an hour, two members of the aircraft accident investigation board who were full-time personnel arrived at the accident scene and took charge. The exercise was fully explained to them and they were told that their actions throughout the remainder of the exercise would be observed and critiqued by the USAAAVS personnel. The other boardmembers, who were part-time Guard members, were notified at their jobs and called to duty to conduct the investigation.

Throughout the exercise, realism was kept at a maximum. The crew gave conflicting stories as to how the accident occurred and fake witnesses were furnished. Specific damage to the aircraft was simulated to test the unit's investigative ability in the maintenance area.

Several hours later, when the required actions were completed, the exercise was moved from the accident site to the aviation flight activity and the board reconvened. The crewmembers of the "crashed" aircraft were called on individually to explain the occurrence of the accident. The exercise was carried through to the completion of the DA Form 2397 series (Technical Report of U.S. Army Aircraft Accident).

All of the aircraft accident investigation boardmembers from two aviation activities within the state were brought together the following day and the USAAAVS personnel conducted 8 hours of classroom instruction.

Specific areas covered were:

- Interpretation and explanation of regulations that govern aircraft accident investigations.
- Proper completion of the DA Form 2397 series report.
- Proper security markings and handling of documents to be included in the accident report.
- Diagramming of the crash site.
- Proper methods of photographing the crash site and other physical evidence.
- Proper methods of interviewing crewmembers and witnesses.
- Investigation techniques.

Emphasis was placed on the importance of a thorough preaccident plan.

- Police and fire departments in all towns within a 15-mile radius of the flight activity or in the required crash rescue plan area should be thoroughly briefed on

Investigation boardmember questions witness at crash site

Boardmembers inspect tail rotor for damage

Photos by SSG Gary Huff, Illinois National Guard

Accident investigation boardmember questions pilot and copilot at crash site

the preaccident plan.

• Crash rescue posters for each type aircraft used by the unit should be furnished to all police and fire stations to familiarize them with the aircraft.

• Joint Service Booklet No. 1, "What to do and How to Report Military Aircraft Accidents," should be given to all civil authorities to keep in their emergency vehicles.

• Letters of agreement with the coroner or medical examiners of the surrounding communities should be signed to avoid confusion in the disposition of casualties and the destruction of toxicological evidence through inadvertent or premature embalming of bodies.

• Letters of agreement with hospitals in surrounding communities should be signed or hospital personnel should be briefed on requirements to contact and/or coordinate with the military when they receive casualties from a military accident.

• Unit commanders should have actual eye-to-eye contact and briefings with the officials and agencies listed in the preaccident plan, especially within the secondary crash alarm system, e.g., actual training of the photographer who would be on call in the event of an accident so he would know the requirements for photographs to be taken.

• Requirements and availability of support equipment, i.e., lighting, cranes, heavy trucks, heavy transportation equipment, and other items that may be needed in the course of the investigation, should be considered.

The underlying theme of the entire class was that the worst time to prepare a preaccident plan is when an accident has just occurred. After the 8 hours of instruction, all participants were issued certificates of course completion. Members of the Illinois ARNG and USAAAVS felt the program had been extremely worthwhile and of such value that the training should be offered Army-wide, especially to Reserve Component units. If your unit needs this training, contact Major Bill Ross, Education and Evaluation Division, USAAAVS, AUTOVON 558-2091/4806, commercial 205-255-2091/4806.

PEARL'S

Personal Equipment & Rescue/Survival Lowdown

If you have a question about personal equipment or rescue/survival gear, write Pearl, USAAAVS, Ft. Rucker, AL 36362

MBU-5/P Oxygen Mask

As promised in the June issue, following is a list of the most useful USAF Technical Orders (T.O.'s) for oxygen equipment. The Master Numerical Index of USAF T.O.'s which can be used to verify the needed publications is T.O. 0-1-15.

T.O. 15X-1-1 – Oxygen Equipment
T.O. 15X1-3-1-33 – High Pressure Cylinders – General
T.O. 15X1-5-2-3 – Oxygen Cylinder and Handwheel Valve Assembly
T.O. 15X1-5-2-4 – Oxygen Cylinder and Handwheel Valve Assembly
T.O. 15X1-5-3-3 – Operating Instructions

T.O. 15X1-5-3-4 – Illustrated Parts Breakdown
T.O. 15X3-2-2-1 – Gauge, Low Pressure, Oxygen
T.O. 15X3-2-2-13 – Gauge, Low Pressure, Oxygen – Overhaul Instructions and Illustrated Parts Breakdown
T.O. 15X5-2-4-1 – Mask, Passenger Type
T.O. 15X5-4-1-101 – Pressure Demand Oxygen System – General
T.O. 15X5-4-4-12 – Field Maintenance Instructions and Breathing Oxygen Mask, MBU-5/P
T.O. 15X5-4-4-12S-1 – Field Maintenance Instructions and Breathing Oxygen Mask, MBU-5/P – Operational Supplemental
T.O. 15X6-3-2-1 – A12 Regulator
T.O. 15X6-3-2-24 – A12 and A14 Diluter Demand Oxygen Regulators, Illustrated Parts Breakdown
T.O. 15X6-3-2-23 – A12 and A14 Diluter Demand Oxygen Regulators, Overhaul Instructions
T.O. 15X6-3-2-33 – Overhaul Instructions for the A12A Diluter Demand Regulator
T.O. 15X6-3-13-3 – Overhaul Instructions for the Pressure Demand Oxygen Regulator CRU-68/A (same as MD1)
T.O. 15X6-5-3-3 – Automatic Positive Pressure Diluter Demand Oxygen MB2 Regulator – Overhaul Instructions
T.O. 15X6-5-3-4 - Automatic Positive Pressure Diluter Demand Oxygen MB2 Regulator - Illustrated Parts Breakdown
T.O. 15X6-5-5-3 - Oxygen Regulator, Overhaul Instructions
T.O. 15X6-5-5-4 - Illustrated Parts Breakdown for Oxygen Regulator

Before ordering any of the above T.O.'s units must first procure a distribution code in accordance with T.O. 00-5-2 by completing AFTO Form 43. Thereafter, requests for USAF T.O.'s will be submitted on AFTO Form 187, also in accordance with T.O. 00-5-2.

If further information is required, contact LTC Frank S. Pettyjohn, M.D., Chief, Cardiovascular Medicine Branch, U.S. Army Aeromedical Research Laboratory, Ft. Rucker, AL 36362, or call AUTOVON 558-5114.

Issue and DX of flight clothing.

I have several questions concerning the direct exchange (DX) and criteria for issue of flight clothing.

The Central Issue Facility (CIF) at my installation will DX flight clothing only if it is ripped or torn. Have criteria, other than obvious rips and holes, been established for the DX of flight clothing?

The new Nomex flight jacket is not being issued here. When I inquired as to why the jacket was not available, I was told that no Nomex jackets would be issued until current stocks of the nylon jacket were depleted. Have criteria been established for replacing the old nylon flight jacket with the new Nomex jacket?

The lightweight flight jacket is not stocked by our CIF. Is this jacket not an authorized item for issue in this area?

The U.S. Army Natick Research and Development Command conducted extensive tests on the fire retardancy of worn Nomex and concluded there was no significant loss of fire retardation qualities until a thickness of 0.012 inches or less is reached at 0.6 pounds per square inch. Realizing that all facilities may not have the capability to make such a precise measurement, a field expedient test may be used. The test consists of pushing a standard ballpoint pen into a single layer of worn, tightly stretched Nomex. If the ballpoint penetrates fully and the fabric shows a tendency to rip instead of separating, then consider the fabric unserviceable. This test is exactly as indicated, a field expedient. The best procedure would be for the local issue facility to secure a micrometer and perform the thickness test. Fire retardant qualities of Nomex are seriously reduced by nonstandard repairs. All repairs must be in accordance with TM 10-8400-201-23.

Issue of the Nomex/nylon jacket is universal on installations that still have nylon jackets, i.e., the nylon jackets will be issued until stocks are depleted. The nylon jacket will provide adequate protection against thermal injuries when worn over the Nomex flight uniform. A number of quality control problems have arisen with the Nomex jacket, thus the nylon jacket may be more serviceable.

CTA 50-900 lists Jacket, Flyers, Man's, Lightweight, as authorized in Zones II, III, and IV. Zone III applies to your state, but lists only the southeastern portion. Your installation is not located in this geographical area and is not normally authorized the lightweight jacket. However, the abbreviation D, column 5, Type of Allowance, opposite the listing for the lightweight jacket (page II-47), means that the jacket may be issued at the discretion of the installation commander. See Appendix A, Explanation of Terms, discretionary allowances and Appendix B, Abbreviations.

ATC action line

UNITED STATES ARMY AIR TRAFFIC CONTROL ACTIVITY

WHAT'S RTCA?

Well, uh – it stands for Radio Technical Commission for Aeronautics.

Aw, come on, what's that all about?

You're right, it's a bunch of $25 words. RTCA's mission is to advance the art and science of aeronautics – through application of electronics, telecommunications and closely allied fields. RTCA has an important mission today – the same mission it has had since 1935.

How do they do it?

They get together the best minds in electronics and aviation, both industry and Government, to study aviation problems and recommend solutions. This includes:

- Studying existing and proposed systems of navigation, communications and traffic control to determine suitability;
- Fostering new developments that may be required;
- And – the real strength of RTCA – serving as a means of coordinating Government and industry views on these matters.

This is RTCA's bread and butter – this is what makes RTCA unique. If there was no such thing as RTCA, we would have to invent one.

RTCA provides the only open continuing forum for the exchange of views on technical matters involving aeronautics, with full participation from all parts of the aviation community.

At an RTCA meeting, whether it is an annual assembly or special committee, the principle of allowing all to make their respective contributions applies. Whether you are a manufacturer, a consultant, a Government employee, an operator or whoever – you have a right to make your input – before the decisions are made, and before the papers are printed. International associates also can stand up and be heard within RTCA's forum.

Think about this a moment – it is important in two ways. First, from the standpoint of the individuals and organizations who get to speak their piece and present their respective viewpoints; and second, it is important from the standpoint of the ultimate users of the RTCA report because they know that it represents the views of the total aviation community. So RTCA's methodology is valid; it is effective.

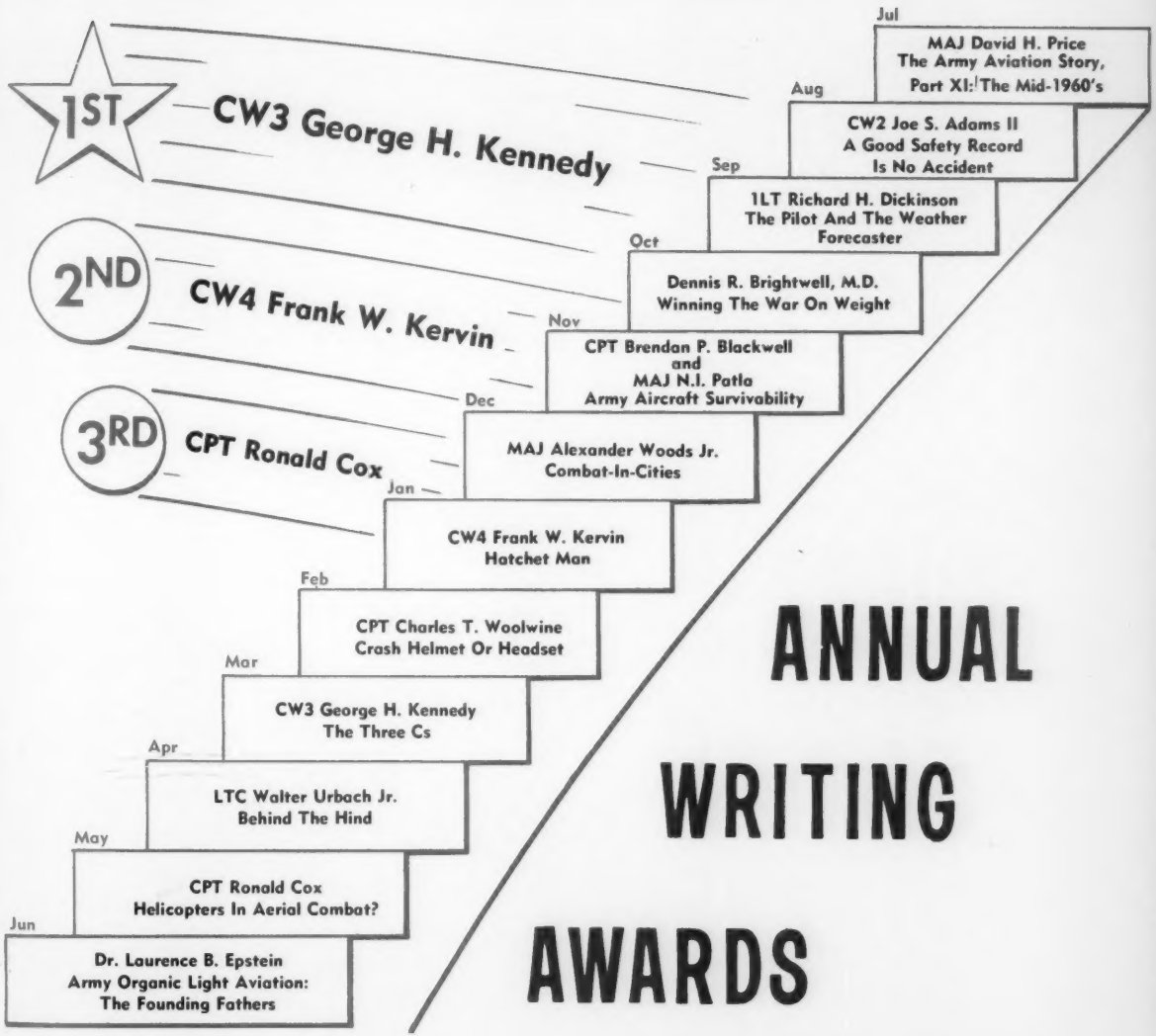
Hold it, just what does RTCA do for me, the Army aviator?

Glad you asked. You know the automatic direction finder (ADF), VHF omnidirectional range (VOR), instrument landing system (ILS) and distance measuring equipment (DME) systems that you are using during flight operations? RTCA is responsible for developing operating characteristics and performance standards for all these systems and many more used in aviation. The development and implementation of the National Microwave Landing System (NMLS) and, in fact, the present airway system is based upon RTCA reports. RTCA's achievements are excellent examples of cooperative voluntary efforts on the part of all concerned to work together for the common good.

RTCA's slogan is, "Dedicated to the Advancement of Aeronautics." In living up to that slogan RTCA has been helping everyone, including Army aviators since the early days of the radio range up to today, and is looking forward to continuing this service in the future. Got some questions?

Readers are encouraged to send questions to:

Director
USAATCA Aeronautical Services Office
Cameron Station
Alexandria, VA 22314



ANNUAL WRITING AWARDS

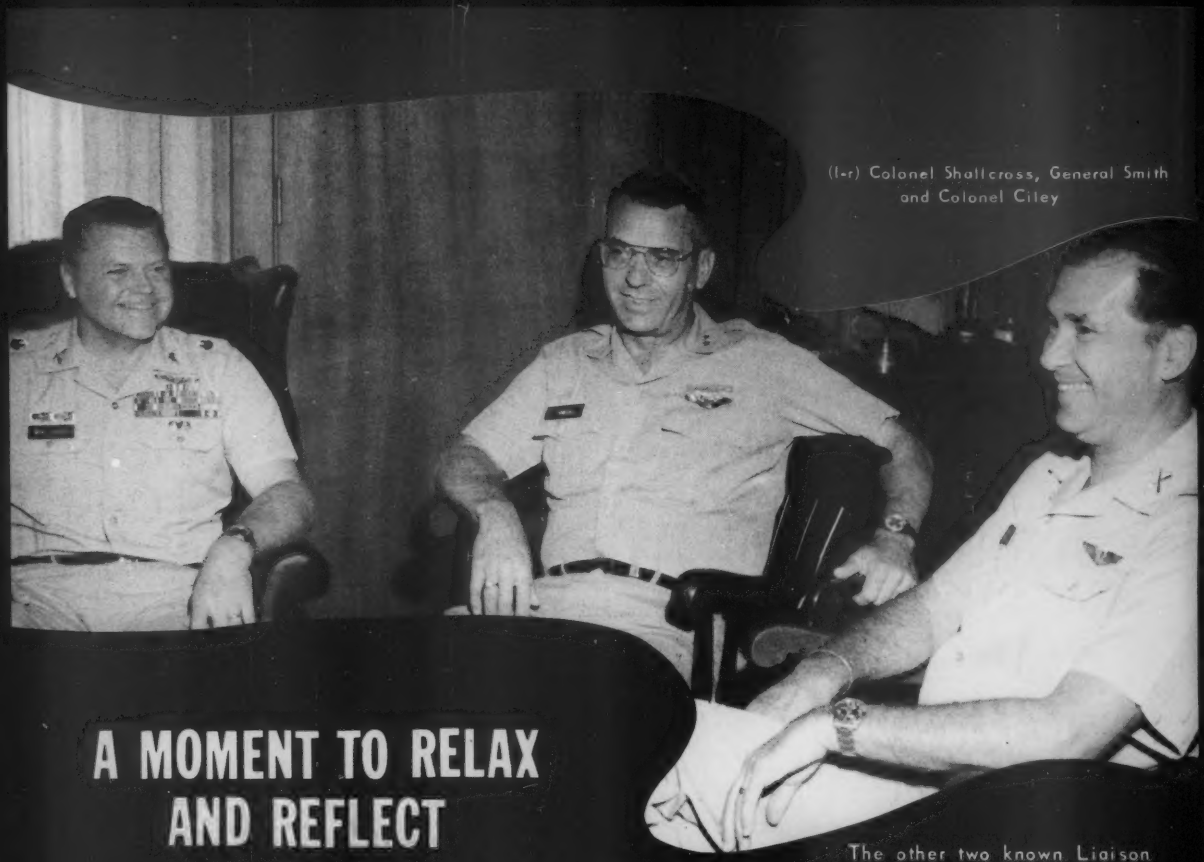
YOU COULD BE a winner if you submit an article to the *AVIATION DIGEST'S* seventeenth annual writing contest beginning this month. Each monthly winner will receive a certificate.

A person who does not place first will receive a certificate signifying that he or she has had an article published in the *DIGEST*. All authors receive credit in their 201 or appropriate civilian personnel files.

Three annual winners will be selected from the monthly first place winners. First, second and third place certificates will be awarded these winners.

To be eligible for publication in the *DIGEST*, an article must be original and concern Army aviation or related subjects. Winning articles are selected by judges who review the manuscripts without bylines. Selection is based on accuracy, completeness, originality, readability, soundness, substance and overall merit.

Authors should include pictures, diagrams or charts available or necessary to illustrate manuscripts. Your articles should be submitted to Editor, *U.S. ARMY AVIATION DIGEST*, P. O. Drawer P, Fort Rucker AL 36362.



(l-r) Colonel Shallcross, General Smith and Colonel Ciley

A MOMENT TO RELAX AND REFLECT

Of the five known active duty Army aviators eligible to wear Liaison Pilot's wings, three are assigned to Fort Rucker, AL.

Recently they met in the office of Fort Rucker's Commander, Major General James C. Smith, for "a moment to relax and reflect" on those early days of their outstanding aviation careers. Liaison Pilot's wings were awarded to fixed wing aviators in the beginning days of Army aviation, and many of the awardees became the backbone of the program as we know it today.

General Smith, commander of Fort Rucker and the U. S. Army Aviation Center since July 1976, received his Liaison Pilot's wings from the Artillery School, Fort Sill, OK, in November 1947.

The Director of the Directorate of Training Developments at Fort Rucker, Colonel C. D. Ciley, Jr., earned his Liaison Pilot's wings in 1949. Today Colonel Ciley is rated in both fixed and rotary wing aircraft.

Colonel George W. Shallcross, named last month as the TRADOC Systems Manager for the ASH at Fort Rucker, was graduated from Liaison Pilot training at San Marcus, TX, in 1951.

The other two known Liaison Pilots on active duty are Major General James F. Hamlet, Deputy The Inspector General, Headquarters, Department of the Army, and Colonel Walt F. Jones, Assistant Deputy Chief of Staff for Logistics, 5th Army, Fort Sam Houston, TX.

If there are any other Liaison Pilots still on active duty please let us know. Our address is Drawer P, Fort Rucker, AL 36362.

Colonel Jones

General Hamlet